installation, start-up and service instructions

SINGLE PACKAGE ROOFTOP ELECTRIC COOLING/ELECTRIC HEATING UNITS

551A
Dura*Pac* Plus Series
Sizes 155-240

Perfect Humidity™

Cancels: II 551A-155-2

II 551A-155-3
3/1/01

CONTENTS

Page

SAFETY CONSIDERATIONS 1
INSTALLATION 1-17
I. Step 1 — Provide Unit Support 1
II. Step 2 — Rig and Place Unit 1
III. Step 3 — Field Fabricate Ductwork 7
IV. Step 4 — Make Unit Duct Connections 7
V. Step 5 — Trap Condensate Drain 7
VI. Step 6 — Make Electrical Connections 8
VII. Step 7 — Make Outdoor-Air Inlet Adjustments 11
VIII. Step 8 — Install Outdoor-Air Hood 12
IX. Step 9 — Install All Accessories 15
X. Step 10 — Install Humidistat for Optional Perfect Humidity™ Dehumidification Package . . 16
START-UP 18-25
SERVICE 26-32
TROUBLESHOOTING 33,34
START-UP CHECKLIST CL-1

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ **WARNING:** Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

IMPORTANT: Units have high ambient operating limits. If limits are exceeded, the unit will automatically lock the compressor out of operation. Manual reset will be required to restart the compressor.

INSTALLATION

I. STEP 1 — PROVIDE UNIT SUPPORT

A. Roof Curb

Assemble and install accessory roof curb or horizontal supply roof curb in accordance with instructions shipped with the accessory. Accessory roof curb and horizontal supply roof curb and information required to field fabricate a roof curb or horizontal supply roof curb are shown in Fig. 1 and 2. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be secured to roof curb before unit is set in place.

IMPORTANT: The gasketing of the unit to the roof curb or horizontal supply roof curb is critical for a leakproof seal. Install gasket supplied with the roof curb or horizontal supply roof curb as shown in Fig. 1. Improperly applied gasket can result in air leaks and poor unit performance.

Roof curb must be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is $\pm 1/16$ in. per linear ft in any direction. Refer to Accessory Roof Curb or Horizontal Supply Roof Curb Installation Instructions for additional information as required.

B. Alternate Unit Support

When the curb or adapter cannot be used, support unit with sleepers using unit curb or adapter support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

II. STEP 2 — RIG AND PLACE UNIT

Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright, and do not drop. Use spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit frame as a reference; leveling tolerance is $\pm 1/16$ in. per linear ft in any direction. See Fig. 3 for additional information. Unit weight is shown in Table 1.

Four lifting holes are provided in ends of unit base rails as shown in Fig. 3. Refer to rigging instructions on unit.

A. Positioning

Provide clearance around and above unit for airflow, safety, and service access (Fig. 4 and 5).

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

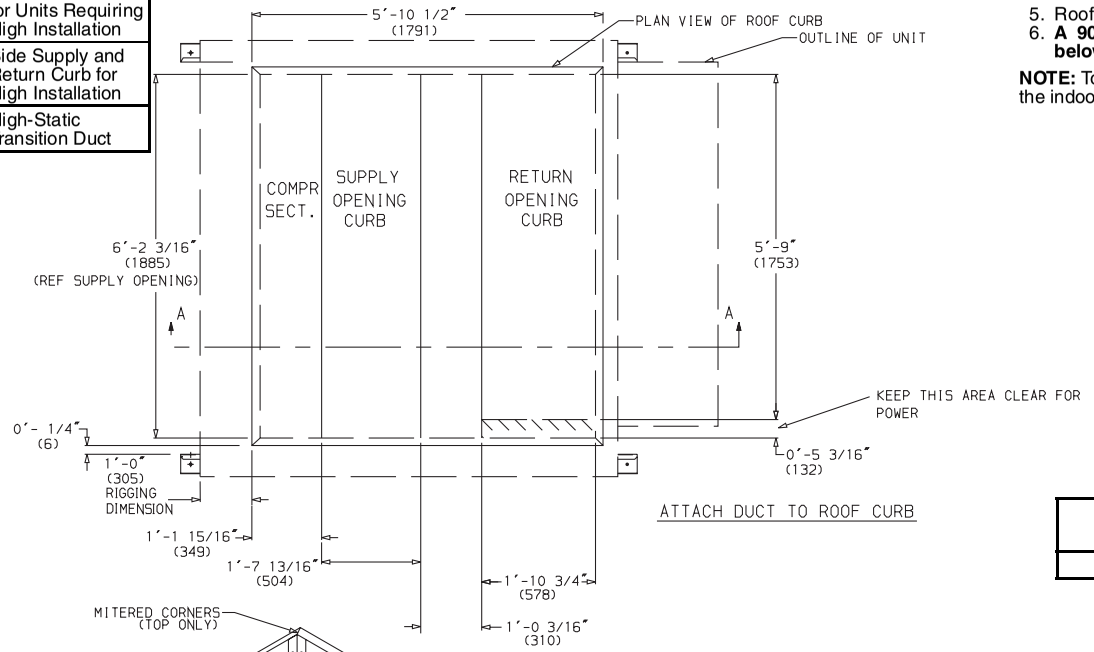
B. Roof Mount

Check building codes for weight distribution requirements.

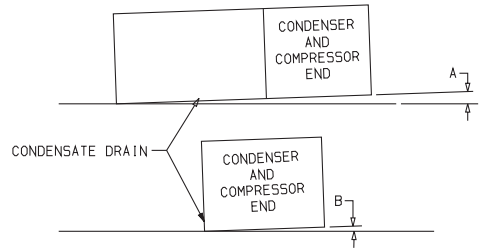
PKG. NO. REF.	CURB HEIGHT	DESCRIPTION
CRRFCURB010A00	1′-2″ (305)	Standard Curb 14″ High
CRRFCURB011A00	2′-0″ (610)	Standard Curb for Units Requiring High Installation
CRRFCURB012A00	2′-0″ (610)	Side Supply and Return Curb for High Installation
CRRFCURB013A00	2′-0″ (610)	High-Static Transition Duct

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels: 1″ thick neoprene coated $1\frac{1}{2}$ lb density.
3. Dimensions in ( ) are in millimeters.
4. ⇨ Direction of airflow.
5. Roof curb: 16 ga. (VA03-56) stl.
6. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters.**

NOTE: To prevent the hazard of stagnant water build-up in the drain pan of the indoor section, unit can only be pitched as shown.



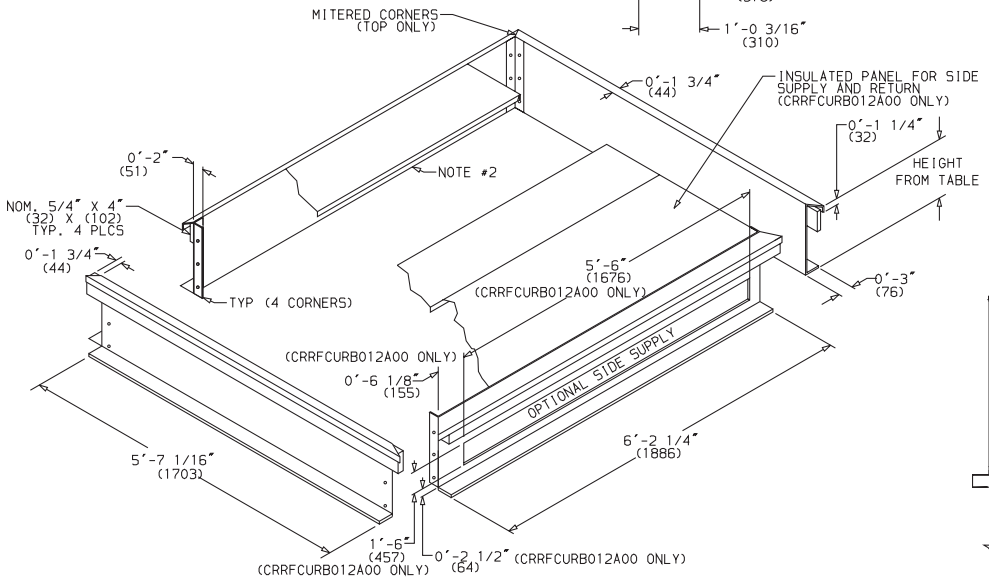
ATTACH DUCT TO ROOF CURB

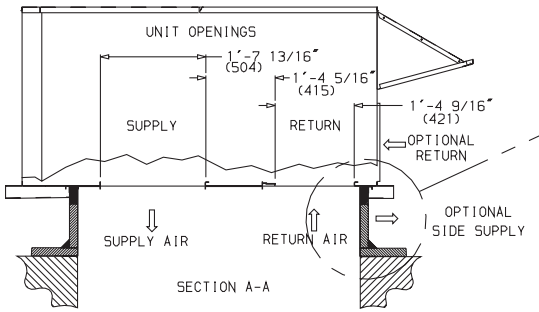


DIMENSIONS* (DEGREES AND INCHES)

UNIT	A		B	
	Deg.	in.	Deg.	in.
ALL	.28	.45	.28	.43

UNIT LEVELING TOLERANCES
*From edge of unit to horizontal.





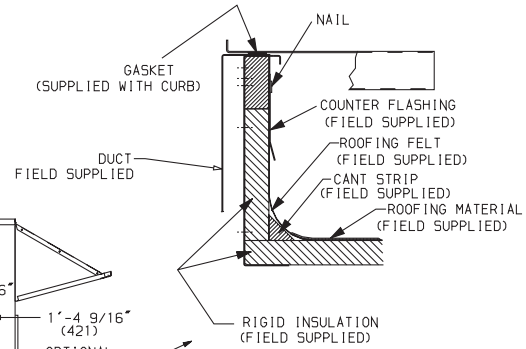
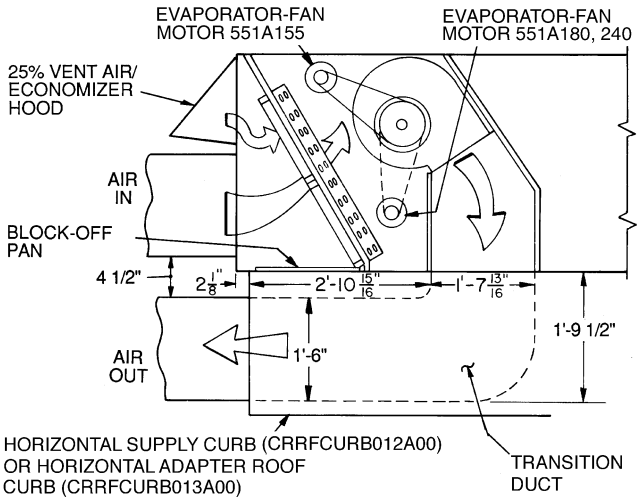
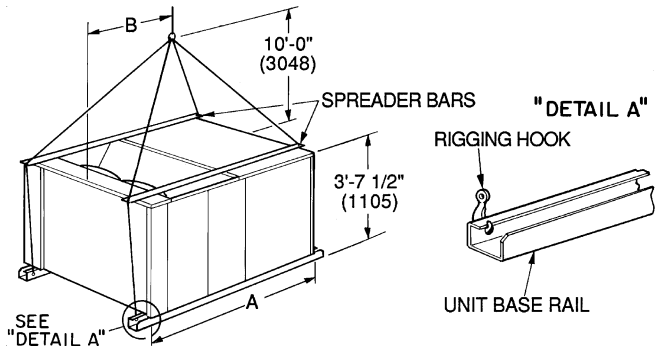


Fig. 1 — Roof Curb Details



NOTE: For preassembled horizontal adapter roof curb part no. CRRFCURB013A00, the accessory kit includes a factory-designed, high-static, regain transition duct. For horizontal curb part no. CRRFCURB012A00, a field-supplied transition duct is required.

Fig. 2 — Horizontal Supply Roof Curb and Horizontal Adapter Roof Curb



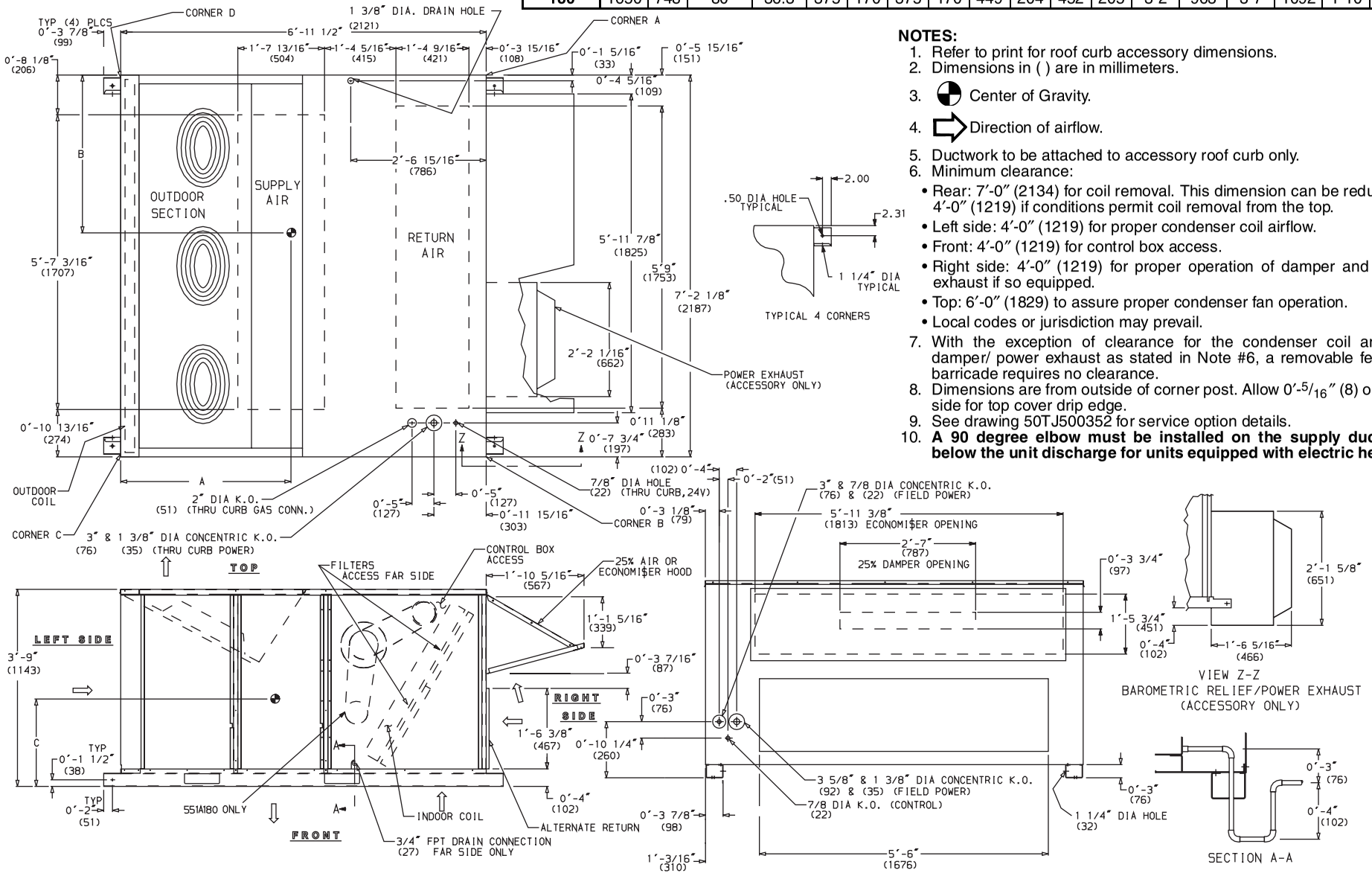
UNIT 551A	MAXIMUM SHIPPING WEIGHT		DIMENSIONS			
			A		B	
	lb	kg	ft-in.	mm	ft-in.	mm
155	1625	737	6-11 1/2	2121	4- 0	1219
180	1700	771	6-11 1/2	2121	3-10	1168
240	1800	816	6-11 1/2	2121	3- 7	1092

NOTES:
1. Dimensions in ( ) are in millimeters.
2. Refer to Fig. 4 and 5 for unit operating weights.
3. Remove boards at ends of unit and runners prior to rigging.
4. Rig by inserting hooks into unit base rails as shown. Use corner post from packaging to protect coil from damage. Use bumper boards for spreader bars.
5. Weights do not include optional EconoMi$er. Add 80 lb (36 kg) for EconoMi$er weight.
6. Weights given are for aluminum evaporator and condenser coil plate fins. Weights include electric heat.
7. Add 75 lb (34 kg) for crating on 551A155 and 180 units. Add 135 lb (61 kg) for crating on 551A240 units.
8. Add 150 lb (68 kg) for copper condenser coil. Add 280 lb (127 kg) for copper condenser and evaporator coils.

⚠ **CAUTION:** All panels must be in place when rigging.

Fig. 3 — Rigging Details

UNIT 551A	STD UNIT WEIGHT		ECONOMI$ER WEIGHT		CORNER A		CORNER B		CORNER C		CORNER D		DIM A		DIM B		DIM C	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	ft-in.	mm	ft-in.	mm	ft-in.	mm
155	1575	714	80	36.3	407	185	375	170	383	174	410	186	3-5	1039	3-5	1054	1-10	559
180	1650	748	80	36.3	375	170	375	170	449	204	452	205	3-2	963	3-7	1092	1-10	559

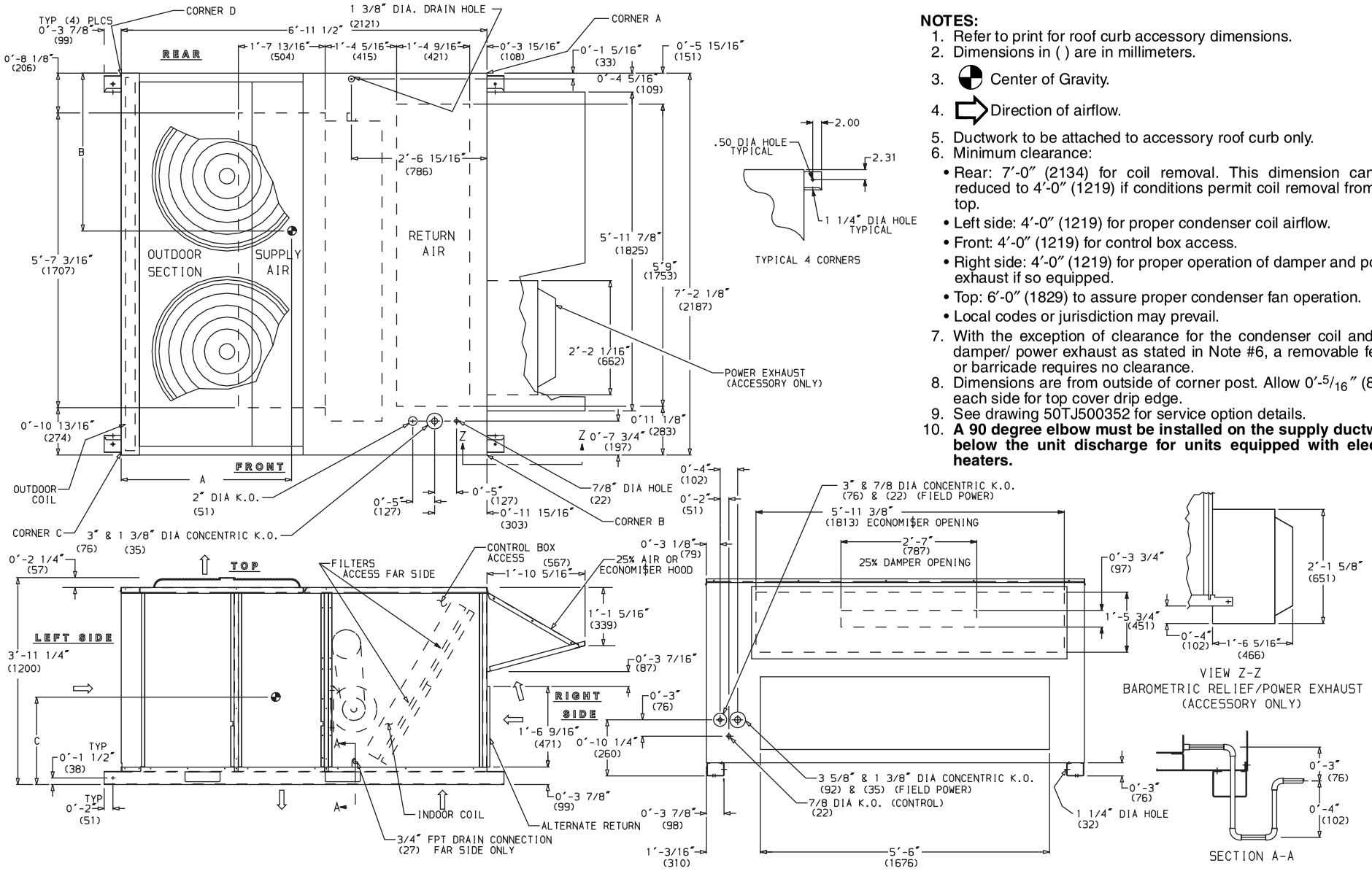


NOTES:

1. Refer to print for roof curb accessory dimensions.
2. Dimensions in ( ) are in millimeters.
3. Center of Gravity.
4. Direction of airflow.
5. Ductwork to be attached to accessory roof curb only.
6. Minimum clearance:
   - Rear: 7′-0″ (2134) for coil removal. This dimension can be reduced to 4′-0″ (1219) if conditions permit coil removal from the top.
   - Left side: 4′-0″ (1219) for proper condenser coil airflow.
   - Front: 4′-0″ (1219) for control box access.
   - Right side: 4′-0″ (1219) for proper operation of damper and power exhaust if so equipped.
   - Top: 6′-0″ (1829) to assure proper condenser fan operation.
   - Local codes or jurisdiction may prevail.
7. With the exception of clearance for the condenser coil and the damper/ power exhaust as stated in Note #6, a removable fence or barricade requires no clearance.
8. Dimensions are from outside of corner post. Allow $0′\text{-}^{5}/_{16}″$ (8) on each side for top cover drip edge.
9. See drawing 50TJ500352 for service option details.
10. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters.**

Fig. 4 — Base Unit Dimensions, 551A155 and 180

UNIT 551A	STD UNIT WEIGHT		ECONOMI$ER WEIGHT		CORNER A		CORNER B		CORNER C		CORNER D		DIM A		DIM B		DIM C	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	ft-in.	mm	ft-in.	mm	ft-in.	mm
240	1750	794	80	36.3	420	191	395	179	448	203	486	221	3-3	988	3-5	1054	1-8	508



NOTES:

1. Refer to print for roof curb accessory dimensions.
2. Dimensions in ( ) are in millimeters.
3. ⊕ Center of Gravity.
4. ⇨ Direction of airflow.
5. Ductwork to be attached to accessory roof curb only.
6. Minimum clearance:
   - Rear: 7′-0″ (2134) for coil removal. This dimension can be reduced to 4′-0″ (1219) if conditions permit coil removal from the top.
   - Left side: 4′-0″ (1219) for proper condenser coil airflow.
   - Front: 4′-0″ (1219) for control box access.
   - Right side: 4′-0″ (1219) for proper operation of damper and power exhaust if so equipped.
   - Top: 6′-0″ (1829) to assure proper condenser fan operation.
   - Local codes or jurisdiction may prevail.
7. With the exception of clearance for the condenser coil and the damper/ power exhaust as stated in Note #6, a removable fence or barricade requires no clearance.
8. Dimensions are from outside of corner post. Allow $0′\text{-}^{5}/_{16}″$ (8) on each side for top cover drip edge.
9. See drawing 50TJ500352 for service option details.
10. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters.**

Fig. 5 — Base Unit Dimensions, 551A240

Table 1 — Physical Data

UNIT 551A		155	180	240
NOMINAL CAPACITY (tons)		12	15	20
OPERATING WEIGHT (lb)				
Unit				
Al/Al*		1575	1650	1750
Al/Cu*		1725	1800	1900
Cu/Cu*		1855	1930	2030
EconoMi$er		80	80	80
Roof Curb†		200	200	200
Perfect Humidity™ Dehumidification Package		40	40	40
COMPRESSOR				
Quantity...Model (Ckt 1, Ckt 2)		1...ZR72KC, 1...ZR57KC	1...ZR94KC, 1...ZR72KC	1...ZR125KC, 1...ZR108KC
Number of Refrigerant Circuits		2	2	2
Crankcase Heater Watts		70	70	70
Loading (% of Full Capacity)		0, 56, 100	0, 60, 100	0, 60, 100
Oil (oz) (Ckt 1, Ckt 2)		60, 66	85, 60	110, 110
REFRIGERANT TYPE		R-22		
Expansion Device		TXV		
Operating Charge (lb)**				
Circuit 1		20.7	19.5	18.5
Circuit 2		11.9	13.45	13.3
CONDENSER COIL		Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins		
Rows...Fins/in.		4...15	4...15	4...15
Total Face Area (sq ft)		21.7	21.7	21.7
CONDENSER FAN		Propeller Type		
Nominal Cfm		10,500	10,500	14,200
Quantity...Diameter (in.)		3...22	3...22	2...30
Motor Hp...Rpm		1/2...1050	1/2...1050	1...1075
Watts Input (Total)		1100	1100	3400
EVAPORATOR COIL		Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced or Copper Plate Fins, Face Split		
Rows...Fins/in.		4...15	4...15	4...15
Total Face Area (sq ft)		17.5	17.5	17.5
EVAPORATOR FAN		Centrifugal Type		
Quantity...Size (in.)		2...10 x 10	2...12 x 12	2...12 x 12
Type Drive		Belt	Belt	Belt
Nominal Cfm		5200	6000	8000
Std Motor Hp		2.9	5	7.5
Opt Motor Hp		3.7		
Motor Nominal Rpm		1725	1745	1745
Std Maximum Continuous Bhp		3.13	6.13	9.47 [208 v], 10.33 [230 v and 460 v]
Opt Maximum Continuous Bhp		4.38	N/A	N/A
Motor Frame Size		56H	184T	213T
Fan Rpm Range	**Low-Medium Static**	834-1064	873-1021	1002 -1151
	High Static	1161-1426	1025-1200	1193-1369
Motor Bearing Type		Ball	Ball	Ball
Maximum Allowable Rpm		1,550	1,550	1,550
Motor Pulley Pitch Dia.	**Low-Medium Static**	3.1/4.1	4.9/5.9	5.4/6.6
	High Static	3.7/4.7	4.9/5.9	5.4/6.6
Nominal Motor Shaft Diameter (in.)		7/8	1 1/8	1 3/8
Fan Pulley Pitch Diameter (in.)	**Low-Medium Static**	6.0	9.4	9.4
	High Static	5.2	8.0	7.9
Nominal Fan Shaft Diameter (in.)		1 3/16	1 7/16	1 7/16
Belt, Quantity...Type...Length (in.)	**Low-Medium Static**	1...BX...42	1...BX...50	1...BX...54
	High Static	1...BX...42	1...BX...48	1...BX...50
Pulley Center Line Distance (in.)		13.5-15.5	13.3-14.8	14.6-15.4
Speed Change per Full Turn of Movable	**Low-Medium Static**	58	37	37
Pulley Flange (Rpm)	**High Static**	67	44	44
Movable Pulley Maximum Full Turns				
From Closed Position		4††	4††	4††
Factory Speed		3.5	3.5	3.5
Factory Speed Setting (Rpm)	**Low-Medium Static**	978	965	1095
	High Static	1327	1134	1303
HIGH-PRESSURE SWITCH (psig)				
Cutout		426		
Reset (Auto.)		320		
LOW-PRESSURE SWITCH (psig)				
Cutout		27		
Reset (Auto.)		44		
FREEZE PROTECTION THERMOSTAT (F)				
Opens		30 ± 5		
Closes		45 ± 5		
OUTDOOR-AIR INLET SCREENS		Cleanable		
Quantity...Size (in.)		2...20 x 25 x 1 1...20 x 20 x 1		
RETURN-AIR FILTERS		Throwaway		
Quantity...Size (in.)		4...20 x 20 x 2 4...16 x 20 x 2		

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper
TXV — Thermostatic Expansion Valve

*Evaporator coil fin material/condenser coil fin material.
†Weight of 14-in. roof curb.

**Circuit 1 uses the lower portion of condenser coil and lower portion of evaporator coils, and Circuit 2 uses the upper portion of both coils.
††Due to belt and pulley style, pulley cannot be set from 0 to 1 1/2 turns open.

III. STEP 3 — FIELD FABRICATE DUCTWORK

Secure all ducts to building structure. Use flexible duct connectors between unit and ducts as required. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

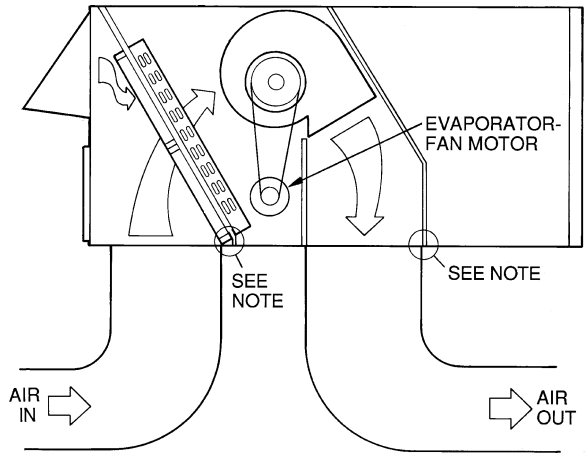
Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

The 551A units with electric heat require a 1-in. clearance for the first 24 in. of ductwork.

Outlet grilles must not lie directly below unit discharge.

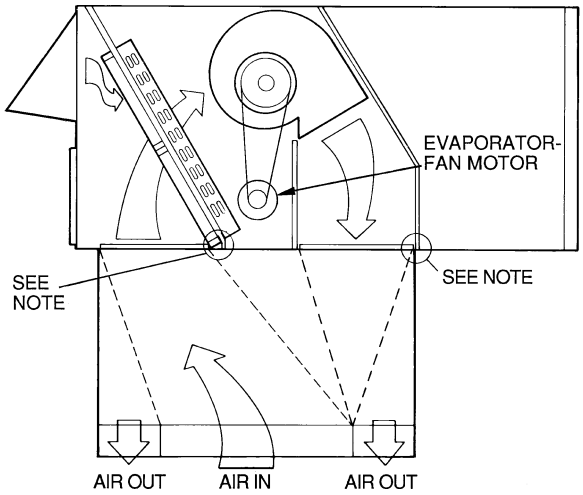
NOTE: A 90-degree elbow must be provided in the ductwork to comply with UL (Underwriters' Laboratories) codes for use with electric heat.

⚠ **WARNING:** For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90 degree turn in the return ductwork between the unit and the conditioned space. If a 90 degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space. Due to electric heater, supply duct will require 90 degree elbow.



NOTE: Do not drill in this area, as damage to basepan may result in water leak.

Fig. 6 — Air Distribution — Thru-the-Bottom (551A180 and 240 Shown)



NOTE: Do not drill in this area, as damage to basepan may result in water leak.

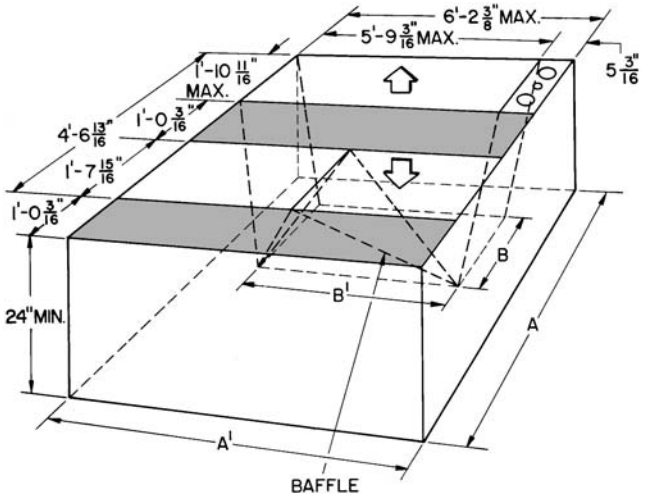
Fig. 7 — Concentric Duct Air Distribution (551A180 and 240 Shown)

IV. STEP 4 — MAKE UNIT DUCT CONNECTIONS

Unit is shipped for thru-the-bottom duct connections. Ductwork openings are shown in Fig. 6. Field-fabricated concentric ductwork may be connected as shown in Fig. 7 and 8. Attach all ductwork to roof curb and roof curb basepans. Refer to installation instructions shipped with accessory roof curb for more information.

V. STEP 5 — TRAP CONDENSATE DRAIN

See Fig. 4, 5, and 9 for drain location. Plug is provided in drain hole and must be removed when unit is operating. One $^3/_4$-in. half-coupling is provided inside unit evaporator section for condensate drain connection. An $8^1/_2$ in. x $^3/_4$-in. diameter nipple and a 2-in. x $^3/_4$-in. diameter pipe nipple are coupled to standard $^3/_4$-in. diameter elbows to provide a straight path down through holes in unit base rails (see Fig. 10). A trap at least 4-in. deep must be used.



Shaded area indicates block-off panels.

NOTE: Dimension A, A′ and B, B′ are obtained from field-supplied ceiling diffuser.

⚠ **CAUTION:** Concentric ducts may only be installed on units without electric heat. Personal injury or unit damage may result.

Fig. 8 — Concentric Duct Details

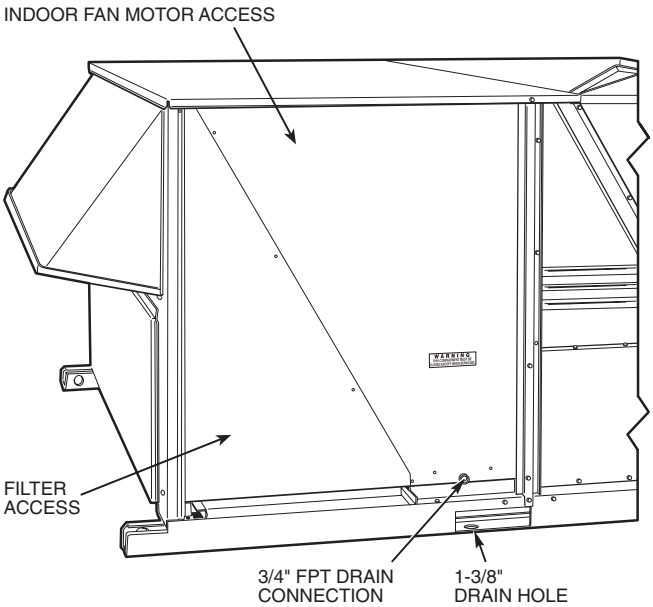


Fig. 9 — Condensate Drain Details (551A155 Shown)

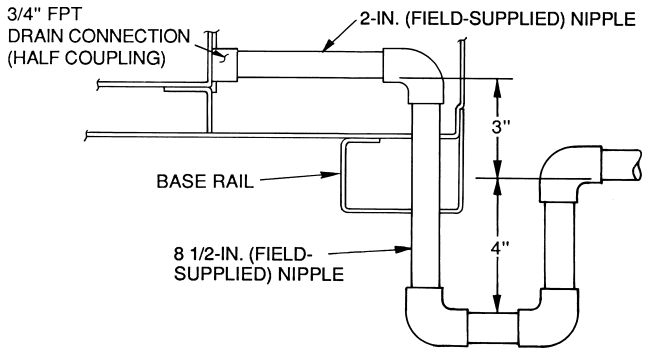


Fig. 10 — Condensate Drain Piping Details

VI. STEP 6 — MAKE ELECTRICAL CONNECTIONS

A. Field Power Supply

Unit is factory wired for voltage shown on nameplate.

When installing units, provide a disconnect, per NEC (National Electrical Code) requirements, of adequate size (Table 2). Electrical heater data is shown in Table 3.

All field wiring must comply with NEC and local requirements.

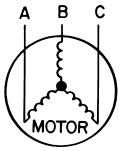
Route power lines through control box access panel or unit basepan (Fig. 4 and 5) to connections as shown on unit wiring diagram and Fig. 11.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and the current must be balanced within 10%.

⚠ **CAUTION:** The correct power phasing is critical in the operation of the scroll compressors. An incorrect phasing will cause the compressor to rotate in the wrong direction. This may lead to premature compressor failure.

Use the following formula to determine the percentage of voltage imbalance.

$$\text{Percentage of Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$



Supply voltage is 460-3-60.

AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{455 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage:

(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent voltage imbalance:

$$\text{Percentage of Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

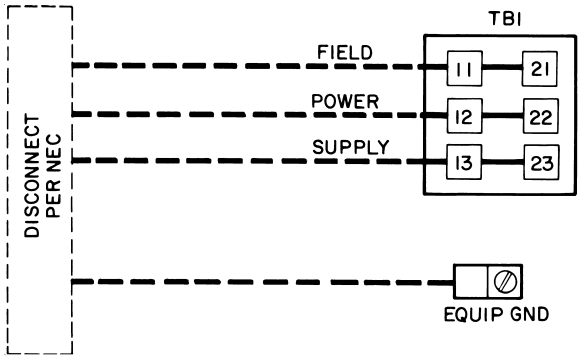
B. Field Control Wiring

Install a Bryant-approved accessory thermostat assembly according to the installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals through conduit in unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 12.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C minimum). All wire larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

Set heat anticipator settings as indicated in Table 4. Settings may be changed slightly to provide a greater degree of comfort for a particular installation.



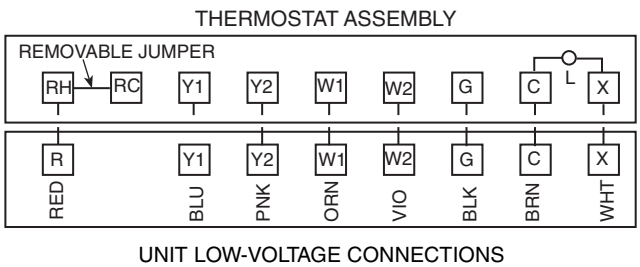
TB1 MAXIMUM WIRE SIZE

UNIT 551A	VOLTAGE	
	208/230	460
All	350 kcmil	2/0

LEGEND

EQUIP — Equipment
GND — Ground
kcmil — Thousand Circular Mils
NEC — National Electrical Code
TB — Terminal Block

Fig. 11 — Field Power Wiring Connections



UNIT LOW-VOLTAGE CONNECTIONS

Fig. 12 — Field Control Thermostat Wiring

Table 2 — Electrical Data

UNIT 551A	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
155 (Standard IFM)	208/230	187	253	20.7	156	19.3	123	3	0.5	1.7	2.9	8.8/ 8.4	— 4.6	— 18.8	— —	— —	59/ 59 64/ 63	70/ 70 80/ 80
													— 4.6	— 18.8	14/19 14/19	39/ 45 39/ 45	60/ 67 66/ 73	70/ 70 80/ 80
													— 4.6	— 18.8	26/34 26/34	71/ 82 71/ 82	100/113 106/119	100/125 110/125
													— 4.6	— 18.8	42/56** 42/56**	117/135 117/135	157/146 163/151	175/175 175/175
	460	414	508	10	70	10	62	3	0.5	0.8	2.9	4.2	— 2.3	— 6.0	— —	— —	29 31	35 40
													— 2.3	— 6.0	15 15	18 18	29 31	35 40
													— 2.3	— 6.0	32 32	39 39	54 57	60 60
													— 2.3	— 6.0	55** 55**	66 66	71 74	80 80
155 (Optional IFM)	208/230	187	253	20.7	156	19.3	123	3	0.5	1.7	3.7	11.0/ 10.5	— 4.6	— 18.8	— —	— —	61/ 61 65/ 66	80/ 80 80/ 80
													— 4.6	— 18.8	14/19 14/19	39/ 45 39/ 45	62/ 70 68/ 76	80/ 80 80/ 80
													— 4.6	— 18.8	26/34 26/34	71/ 82 71/ 82	102/116 108/122	110/125 110/125
													— 4.6	— 18.8	42/56** 42/56**	117/135 117/135	159/149 165/155	175/175 175/175
	460	414	508	10	70	10	62	3	0.5	0.8	3.7	4.8	— 2.3	— 6.0	— —	— —	30 32	35 40
													— 2.3	— 6.0	15 15	18 18	30 32	35 40
													— 2.3	— 6.0	32 32	39 39	55 58	60 60
													— 2.3	— 6.0	55** 55**	66 66	72 75	80 80
180	208/230	187	253	32.1	195	20.7	156	3	0.5	1.7	5.0	15.8/ 15.8	— 4.6	— 18.8	— —	— —	82/ 82 86/ 86	110/110 110/110
													— 4.6	— 18.8	26/34 26/34	71/ 82 71/ 82	109/122 114/128	110/125 125/150
													— 4.6	— 18.8	42/56 42/56	117/135 117/135	166/155 172/161	175/175 175/175
													— 4.6	— 18.8	56/75** 56/75**	156/180 156/180	176/200 182/206	200/225 200/225
	460	414	508	16.4	95	10	70	3	0.5	0.8	5.0	7.9	— 2.3	— 6.0	— —	— —	41 43	50 50
													— 2.3	— 6.0	32 32	39 39	59 62	60 70
													— 2.3	— 6.0	55 55	66 66	76 79	90 90
													— 2.3	— 6.0	80** 80**	96 96	106 109	125 125
240	208/230	187	253	42	239	33.6	225	2	1	6.6	7.5	25.0/ 25.0	— 4.6	— 18.8	— —	— —	124/124 129/129	150/150 150/150
													— 4.6	— 18.8	26/34 26/34	71/ 82 71/ 82	124/134 129/140	150/150 150/150
													— 4.6	— 18.8	42/56 42/56	117/135 117/135	178/166 183/172	200/175 200/175
													— 4.6	— 18.8	56/75** 56/75**	156/180 156/180	187/211 193/217	200/225 200/225
	460	414	508	19.2	125	17.3	114	2	1	3.3	7.5	13.0	— 2.3	— 6.0	— —	— —	61 63	80 80
													— 2.3	— 6.0	32 32	39 39	65 68	80 80
													— 2.3	— 6.0	55 55	66 66	82 85	90 90
													— 2.3	— 6.0	80** 80**	96 96	112 115	125 125

(See Legend on page 10.)

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, and 480 v. Heaters are rated at 240 v, or 480 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.
**Heaters are field installed only.

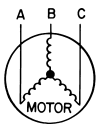
NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

   Example: Supply voltage is 460-3-60.



   AB = 452 v
   BC = 464 v
   AC = 455 v

   $$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

   $$= \frac{1371}{3}$$

   $$= 457$$

   Determine maximum deviation from average voltage.
   (AB) 457 – 452 = 5 v
   (BC) 464 – 457 = 7 v
   (AC) 457 – 455 = 2 v

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

   $$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

   $$= 1.53\%$$

   This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

   IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.
3. MCA calculation for units with electric heaters over 50 kW = (1.25 x IFM amps) + (1.00 x heater FLA).

Table 3 — Electric Resistance Heater Data

UNIT 551A	HEATER kW Unit Voltages					HEATER STAGES	% HEAT PER STAGE	MAXIMUM STAGES*	MINIMUM Heating Cfm		HEATER AMPS				
	208	230	240	460	480				Cfm	L/s	208	230	240	460	480
155	14	17	19	14	15	1	100	1	3750	1770	39.3	43.4	45.3	17.2	17.9
	26	31	34	30	32	2	50/50	2			71.3	78.9	82.3	37.3	39.0
	42	52	56	50	55	2	33/67	3			117.0	129.4	135.0	63.3	66.1
180	26	31	34	30	32	2	50/50	2	3750	1770	71.3	78.8	82.3	37.3	39.0
	42	52	56	50	55	2	33/67	3			117.0	129.4	135.0	63.3	66.1
	56	69	75	73	80	2	50/50	4			155.9	172.4	179.9	92.0	96.0
240	26	31	34	30	32	2	50/50	2	5000	2360	71.3	78.8	82.3	37.3	39.0
	42	52	56	50	55	2	33/67	3			117.0	129.4	135.0	63.3	66.1
	56	69	75	73	80	2	50/50	4			155.9	172.4	179.9	92.0	96.0

*Maximum number of stages using accessory low-ambient kit or head pressure control device and low-ambient kit.

NOTE: Heaters are rated at 240, and 480 v.

C. Optional Non-Fused Disconnect

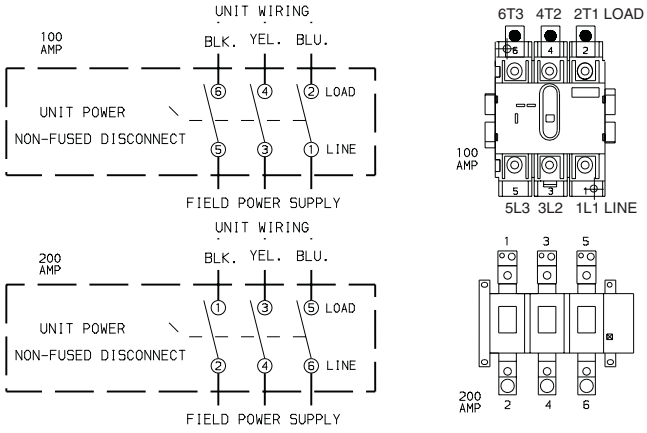
On units with the optional non-fused disconnect, incoming power will be wired into the disconnect switch. Refer to Fig. 13 for wiring for 100 and 200 amp disconnect switches. Units with an MOCP (maximum overcurrent protection) under 100 will use the 100 amp disconnect switch. Units with an MOCP over 100 will use the 200 amp disconnect switch. Refer to the applicable disconnect wiring diagram.

To prevent breakage during shipping, the disconnect handle and shaft are shipped and packaged inside the unit control box. Install the disconnect handle before unit operation. To install the handle and shaft, perform the following procedure:

1. Open the control box door and remove the handle and shaft from shipping location.
2. Loosen the Allen bolt located on the disconnect switch. The bolt is located on the square hole and is used to hold the shaft in place. The shaft cannot be inserted until the Allen bolt is moved.
3. Insert the disconnect shaft into the square hole on the disconnect switch. The end of the shaft is specially cut and the shaft can only be inserted in the correct orientation.
4. Tighten the Allen bolt to lock the shaft into position.
5. Close the control box door.
6. Attach the handle to the external access door with the two screws provided. When the handle is in the ON position, the handle will be vertical. When the handle is in the OFF position, the handle will be horizontal.
7. Turn the handle to the OFF position and close the door. The handle should fit over the end of the shaft when the door is closed.
8. The handle must be in the OFF position to open the control box door.

D. Optional Convenience Outlet

On units with optional convenience outlet, a 115-v GFI (ground fault interrupt) convenience outlet receptacle is provided for field wiring. Field wiring should be run through the $^{7}/_{8}$-in. knockout provided in the basepan near the return air opening.



NOTE: The disconnect takes the place of TB-1 as shown on the unit wiring diagram label and the component arrangement label.

Fig. 13 — Optional Non-Fused Disconnect Wiring

VII. STEP 7 — MAKE OUTDOOR-AIR INLET ADJUSTMENTS

A. Manual Outdoor-Air Damper

All units (except those equipped with a factory-installed economizer) have a manual outdoor-air damper to provide ventilation air. Damper can be preset to admit up to 25% outdoor air into return-air compartment. To adjust, loosen securing screws and move damper to desired setting. Then retighten screws to secure damper (Fig. 14).

B. Optional EconoMi$er

EconoMi$er Motor Control Module (Fig. 15-17)

Set the ECONSP dial to the "D" setting (Fig. 16). The control module is located on the EconoMi$er motor. See Fig. 15 and 17.

Damper Vent Position Setting

1. Set fan switch at ON position (continuous fan operation) and close night switch if used.
2. Set system selector switch to OFF position.
3. Turn Min Pos (%) dial slowly until dampers assume desired vent position. *Do not manually operate EconoMi$er motor since damage to motor will result.*

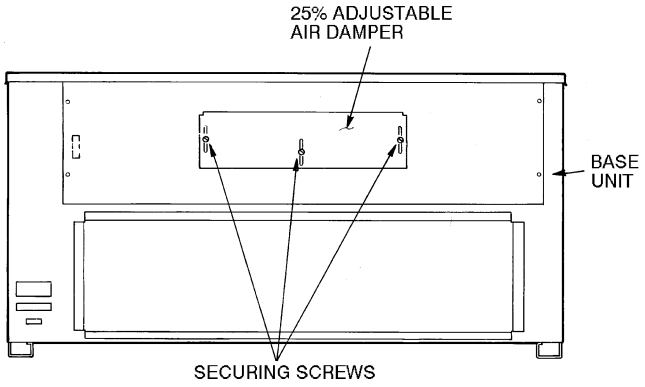


Fig. 14 — 25% Outdoor-Air Section Details

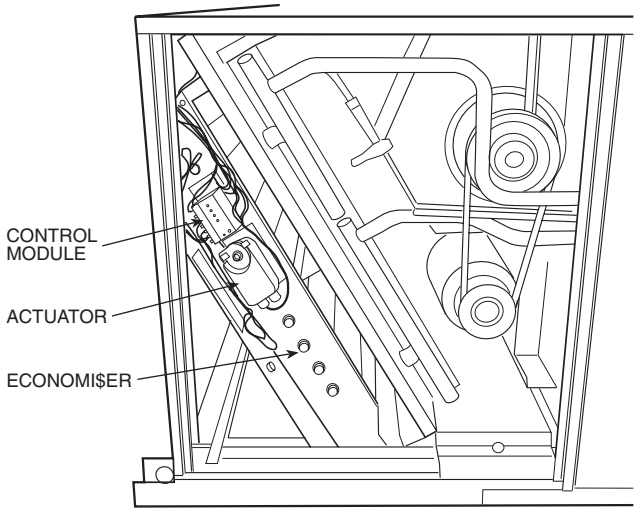


Fig. 15 — EconoMi$er Damper Assembly — End View

Table 4 — Heat Anticipator Settings

UNIT 551A	UNIT VOLTAGES	kW*	STAGE 1	STAGE 2
155-240	208/230-3-60	14/19	.40	—
		26/34	.40	.66
		42/56	.66	.40
		56/75	.66	.66
	460-3-60	32	.40	.40
		55	.40	.66
		80	.66	.66

*Heater kW is based on heater voltage of 208 v, 240 v, or 480 v.

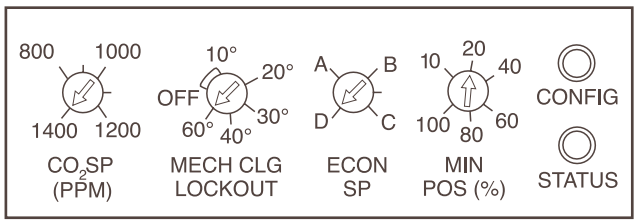


Fig. 16 — EconoMi$er Control Module Adjustment Potentiometers

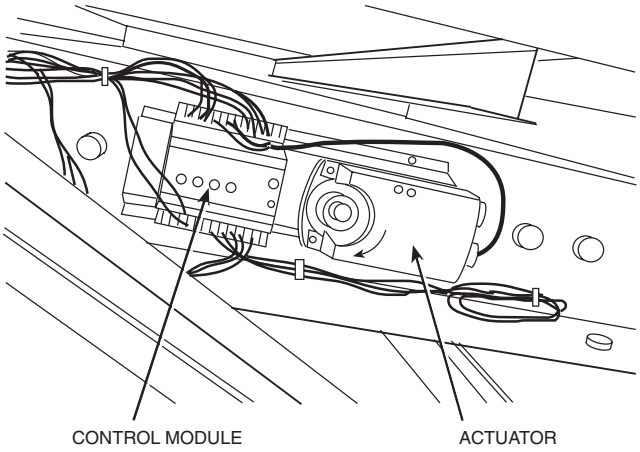


Fig. 17 — EconoMi$er Control Module Location

VIII. STEP 8 — INSTALL OUTDOOR-AIR HOOD

The same type of factory-installed hood is used on units with 25% air ventilation and units with an EconoMi$er.

NOTE: The hood top panel, upper and lower filter retainers, hood drain pan, baffle (180-240), and filter support bracket are secured opposite the condenser end of the unit. The screens, hood side panels, remaining section of filter support bracket, seal strip, and all other hardware are in a package located inside the return-air filter access panel (Fig. 18).

1. Attach seal strip to upper filter retainer. See Fig. 19.
2. Assemble hood top panel and side panels, upper filter retainer, and hood drain pan (Fig. 20).
3. Secure lower filter retainer and long section of filter support bracket to unit. See Fig. 20. Leave screws loose on size 180 and 240 units.
4. Slide baffle (size 180 and 240 units) behind lower filter retainer and tighten screws.
5. Loosen sheet metal screws for base unit top panel located above outdoor-air inlet opening, and remove screws for hood side panels located on the sides of the outdoor-air inlet opening.
6. Match notches in hood top panel to unit top panel screws. Insert hood flange between unit top panel flange and unit. Tighten screws.
7. Hold hood side panel flanges flat against unit, and install screws removed in Step 5.
8. Insert outdoor-air inlet screens and spacer in channel created by lower filter retainer and filter support bracket.
9. Attach remaining short section of filter support bracket.

A. Outdoor Air Enthalpy Sensor Installation

Perform the following procedure to install the outdoor air enthalpy sensor (part no. CROUTENT001A00).

1. Remove the outdoor air temperature sensor cover. See Fig. 21. Save cover and screws.
2. Disconnect the wiring from the installed outdoor air temperature sensor. See Fig. 22.
3. Use a $^1/_4$-in. nut driver to remove the 2 screws securing the outdoor air temperature sensor to the sheet metal.
4. Mount the outdoor air enthalpy sensor in the outdoor air temperature sensor location using the screws removed in Step 3.
5. Connect the outdoor air enthalpy sensor wiring harness to the EconoMi$er control module and sensor.
6. Re-install sensor cover saved from Step 1.

B. Return Air Temperature Sensor or Return Air Enthalpy Sensor Installation

Perform the following procedure to install the return air temperature sensor (part no. CRRETTMP001A00) or return air enthalpy sensor (part no. CRRETENT001A00).

1. Attach the sensor to the mounting bracket using 2 self-tapping $^1/_2$-in. screws provided.
2. Mount the bracket to the inside of the return air opening flange using a $^1/_4$-in. nut driver and 2 no. 6 sheet metal screws.

NOTE: The sensor must be mounted in an upright position.

3. Feed the sensor wiring through the bushing in EconoMi$er to secure wires.
4. Route sensor wiring harness from sensor to EconoMi$er control module. Secure wiring harness to the original harness using tie wraps.
5. Wire the sensor to the EconoMi$er control module. See Fig. 23 and 24.

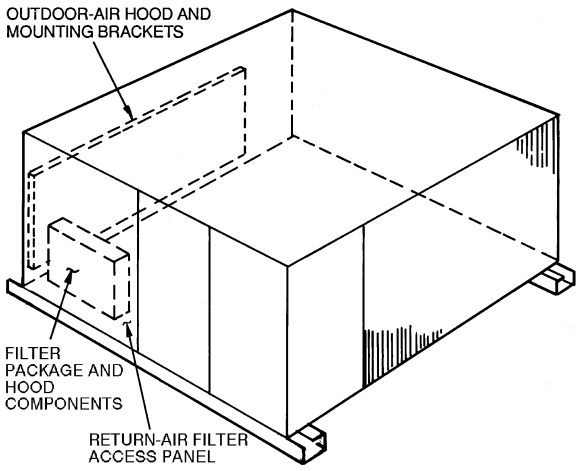


Fig. 18 — Outdoor-Air Hood Component Location

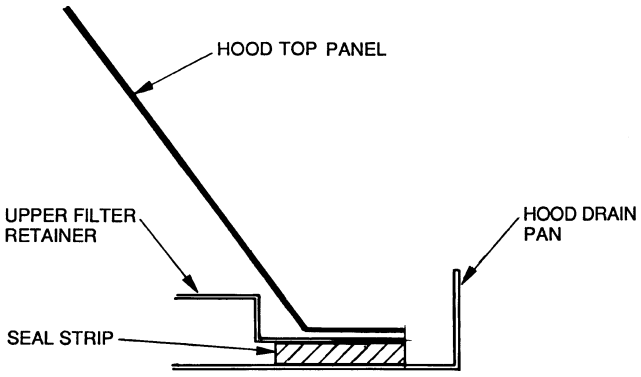
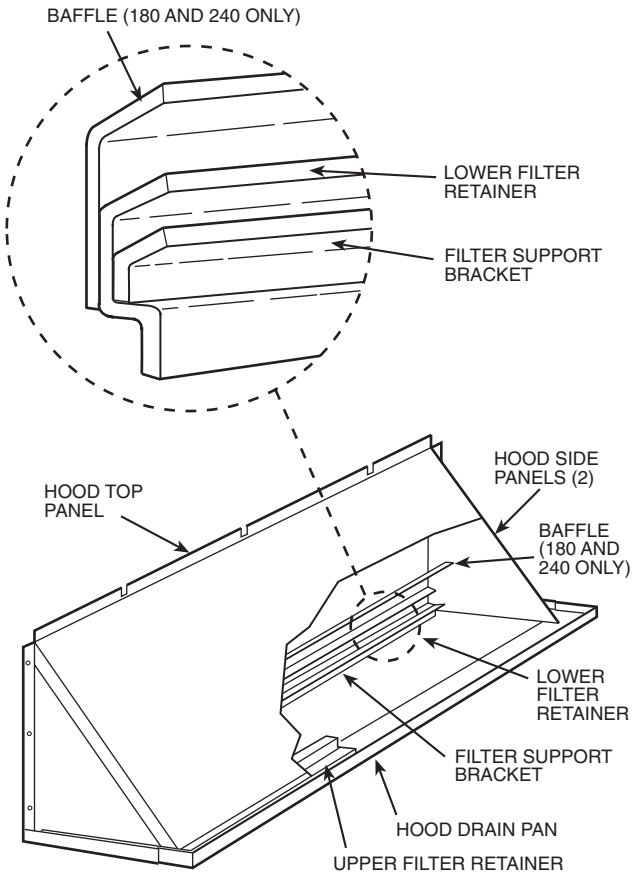


Fig. 19 — Seal Strip Location (Air Hood Cross-Sectional View)



NOTE: The outdoor-air hood comes with a baffle which is used on 180 and 240 units only; discard baffle for 155 units.

Fig. 20 — Outdoor-Air Hood Details

C. Commissioning

The EconoMi$er saves energy when it uses outdoor air to provide free cooling instead of mechanical air conditioning. The EconoMi$er switchover strategy determines if the outdoor air is suitable for free cooling. The EconoMi$er chooses the switchover strategy with the most energy savings, provided that the required sensors are connected and functioning normally.

IMPORTANT: If a sensor stops functioning normally (becomes unreliable), the EconoMi$er switches to the next best strategy.

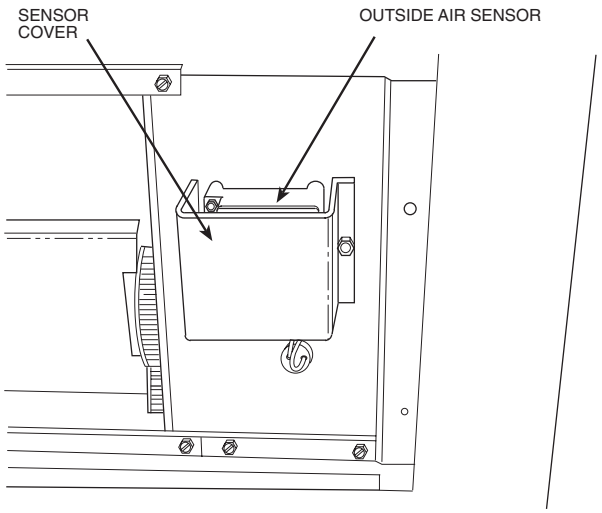


Fig. 21 — Outdoor-Air Sensor Location

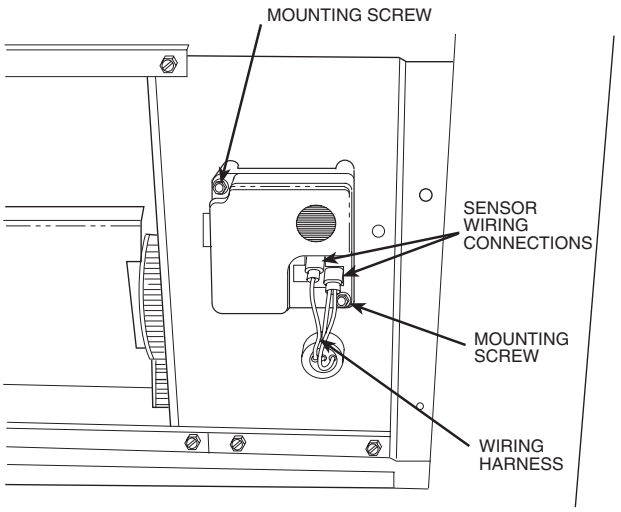


Fig. 22 — Outdoor-Air Sensor Details

Refer to Table 5 to determine the sensors required for each strategy.

Differential Enthalpy Switchover Strategy

The differential enthalpy switchover strategy must be selected manually, if required. To enable, press and hold the CONFIG button for 30 seconds, then release. The LED will flash twice to indicate the change of configuration.

To return to single enthalpy mode, press and hold the CONFIG button for 30 seconds. The LED will flash once to indicate the change of configuration.

D. Discharge Air Thermistor (DAT)

The discharge air thermistor is factory-mounted on the supply-fan housing in the fan section of the unit. The DAT is factory-wired to the EconoMi$er Control Module.

E. CO_2 Control Setup

If a CO_2 sensor is not being used, proceed to the next section. If a CO_2 sensor is being used, perform the following:

1. Determine the value at which you want the minimum position of the dampers to begin opening to allow a greater amount of outdoor air to enter. The range is 800 to 1,400 ppm.
2. Locate the CO_2 SP (PPM) potentiometer and adjust to the desired set point. See Fig. 16.

F. Mechanical Cooling Lockout

Determine the outdoor-air temperature at which you want the mechanical cooling (compressors) to be disabled. Locate the mechanical cooling lockout (MECH CLG LOCKOUT) potentiometer. To disable this feature, turn the potentiometer counterclockwise (CCW) to the OFF position. Otherwise, set the value between 10 and 60 F. Mechanical cooling will not operate when the outdoor air temperature is below this value. See Fig. 16.

G. Dry Bulb Changeover Set Up

Determine the dry bulb changeover set point from Table 6. The settings are A, B, C and D. Locate the ECON SP potentiometer and set the dry bulb changeover set point. See Fig. 16. When the OAT is above this set point, the damper is limited to minimum position setting.

If a potentiometer fails, its setting will default to the values in Table 7.

Table 5 — EconoMi$er Switchover Control Strategy

ECONOMI$ER SWITCHOVER STRATEGY	SENSORS REQUIRED			
	Outdoor Air Temperature	Outdoor Air Enthalpy	Return Air Temperature	Return Air Enthalpy
Dry Bulb	X			
Single Enthalpy		X		
Differential Temperature	X		X	
Differential Enthalpy*		X		X

*Must be selected manually.

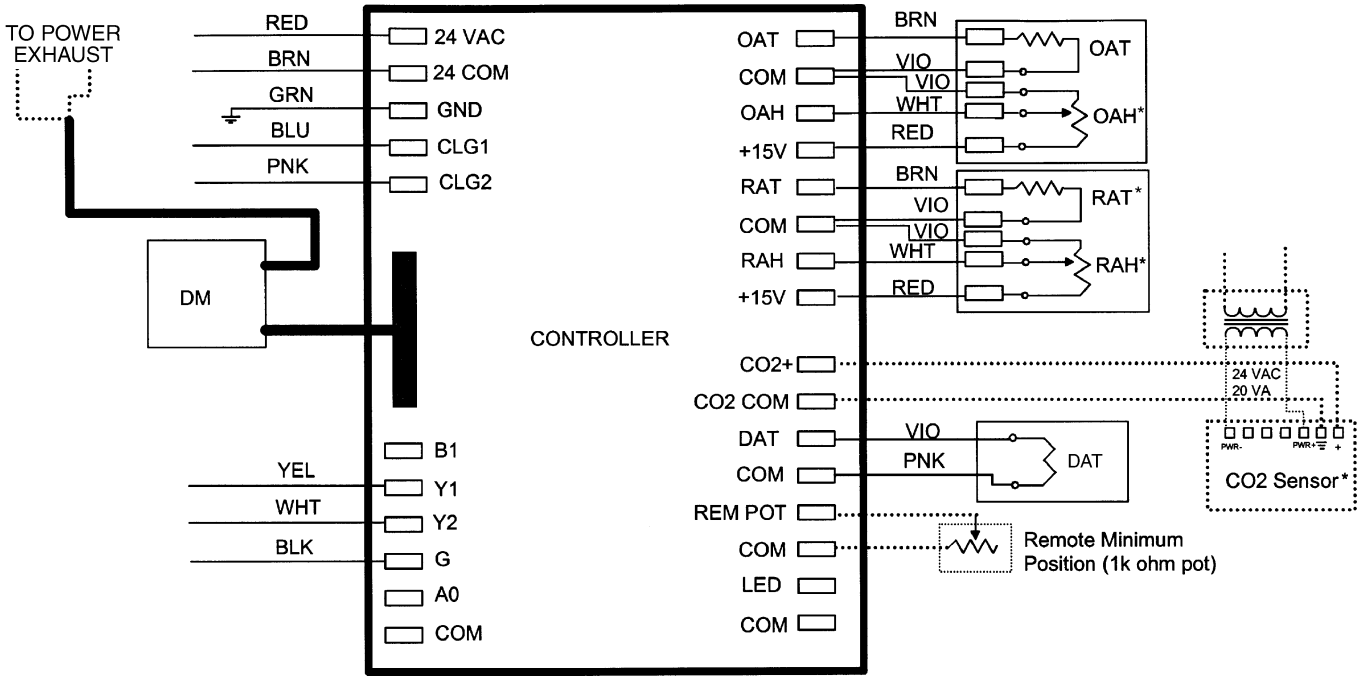
Table 6 — Changeover Set Points

SETTINGS	A	B	C	D
Dry Bulb (°F)	73	69	66	63
Single Enthalpy* (Btu/lb)	27	25	24	22
Differential Temperature* (°F, Not Adjustable)	2	2	2	2
Differential Enthalpy* (Btu/lb, Not Adjustable)	1	1	1	1

*Field-installed accessory.

Table 7 — Default Potentiometer Settings

POTENTIOMETER	DEFAULT SETTING
CO_2 SP (PPM)	1,000
MECH CLG LOCKOUT	50 F
ECON SP	D
MIN POS (%)	20



LEGEND

COM — Common
DAT — Discharge Air Thermistor
DM — Damper Motor
GND — Ground
OAH — Outdoor-Air Enthalpy Sensor
OAT — Outdoor-Air Temperature Sensor
POT — Potentiometer
RAH — Return-Air Enthalpy Sensor
RAT — Return-Air Temperature Sensor
REM — Remote

*OAT sensor shipped with economizer option. OAH, RAT, RAH and CO_2 are field-installed accessories.

Fig. 23 — Typical EconoMi$er Wiring

H. Ventilation Air (Minimum Position Set Up)

If ventilation air is not required, skip this section. If ventilation air is required, perform the following:

1. The indoor fan must be on to set the ventilation air. Either put the thermostat in the continuous fan mode or jumper the R and G terminals at the rooftop unit connection board.
2. Locate the minimum position (MIN POS) potentiometer. Turn the potentiometer full CCW to fully close the outdoor air dampers. Turn the potentiometer gradually clockwise (CW) to the desired position. See Fig. 16.
3. Replace the filter access panel. See Fig. 18. Ensure the filter access panel is securely engaged.
4. Calculate the minimum airflow across the EconoMi$er.
   a. Calculate % of outside air using the following formula.

      % Outdoor air through EconoMi$er

      $$\%\ \text{Outdoor air} = \frac{\text{Mixture Temp} - \text{Return Air Temp}}{\text{Outdoor Temp} - \text{Return Air Temp}}$$

   b. Multiply total CFM by percentage outdoor air, this gives outdoor air volume in CFM.

⚠ WARNING: Personal Injury Hazard. Avoid possible injury by keeping fingers away from damper blades.

IX. STEP 9 — INSTALL ALL ACCESSORIES

After all the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory.

A. Motormaster® I Control Installation (551A155 and 180 Only)

Install Field-Fabricated Wind Baffles

Wind baffles must be field-fabricated for all units to ensure proper cooling cycle operation at low ambient temperatures. See Fig. 25 for baffle details. Use 20-gage, galvanized sheet metal, or similar corrosion-resistant metal for baffles. Use field-supplied screws to attach baffles to unit. Screws should be $^1/_4$-in. diameter and $^5/_8$-in. long. Drill required screw holes for mounting baffles.

⚠ CAUTION: To avoid damage to the refrigerant coils and electrical components, use recommended screw sizes only. Use care when drilling holes.

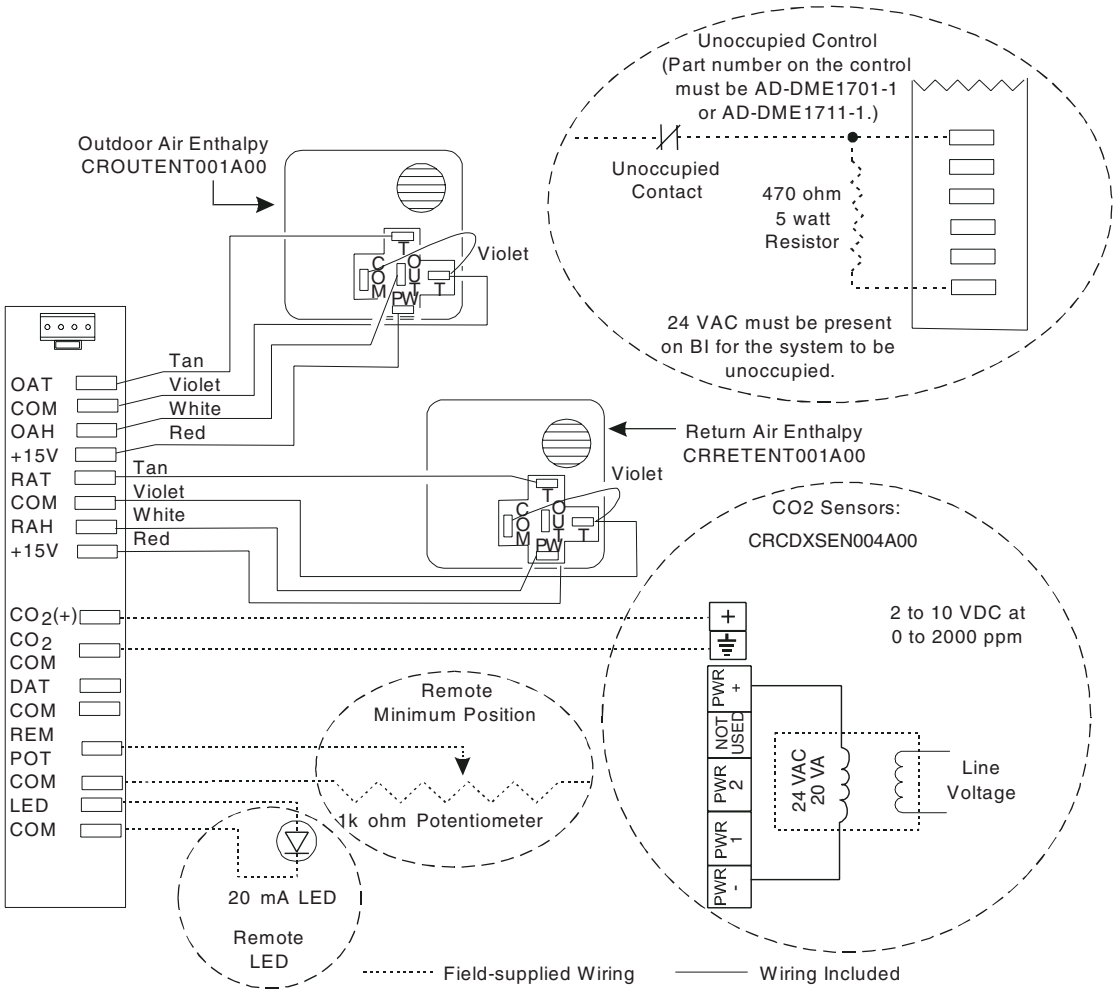


Fig. 24 — Typical EconoMi$er Sensor Wiring

Install Motormaster® I Controls

Only one Motormaster I control is required per unit. The Motormaster I control must be used in conjunction with the Accessory 0° F Low Ambient Kit (purchased separately). The Motormaster I device controls outdoor fan no. 1 while outdoor fans no. 2 and 3 are sequenced off by the Accessory 0° F Low Ambient Kit.

Accessory 0° F Low Ambient Kit — Install the Accessory 0° F Low Ambient Kit per instruction supplied with accessory.

Sensor Assembly — Install the sensor assembly in the location shown in Fig. 26.

Motor Mount — To ensure proper fan height, replace the existing motor mount with the new motor mount provided with accessory.

Transformer (460-v Units Only) — On 460-volt units a transformer is required. The transformer is provided with the accessory and must be field-installed.

Motormaster I Control — Recommended mounting location is on the inside of the panel to the left of the control box. The control should be mounted on the inside of the panel, vertically, with leads protruding from bottom of extrusion.

B. Motormaster III Control Installation (551A240 Only)

Install Field-Fabricated Wind Baffles

Wind baffles must be field-fabricated for all units to ensure proper cooling cycle operation at low ambient temperatures. See Fig. 25 for baffle details. Use 20-gage, galvanized sheet metal, or similar corrosion-resistant metal for baffles. Use field-supplied screws to attach baffles to unit. Screws should be $^1/_4$-in. diameter and $^5/_8$-in. long. Drill required screw holes for mounting baffles.

⚠ **CAUTION:** To avoid damage to the refrigerant coils and electrical components, use recommended screw sizes only. Use care when drilling holes.

Replace Outdoor Motor

Replace outdoor fan motor no. 1 with motor included in accessory kit. Existing motor is not Motormaster® III compatible.

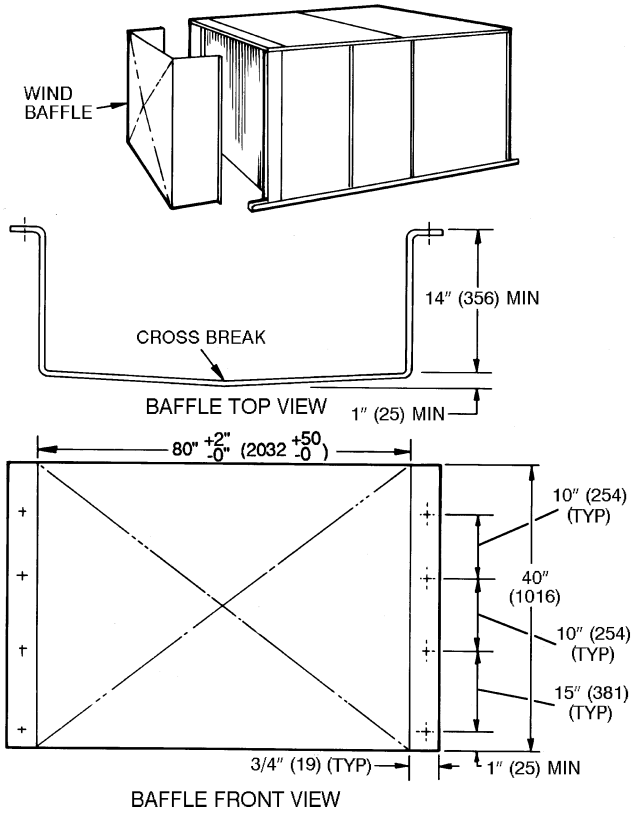
Install Motormaster III Controls

Only one Motormaster III control is required per unit.

Sensor — Install the sensor for thermistor input control in the location shown in Fig. 26. Connect sensor leads to the purple and grey control signal leads on the Motormaster III control.

Signal Selection Switch — Remove the cover of the Motormaster III control. Set the switch to accept the thermistor sensor input signal. Set the frequency to match the unit power supply (60 Hz).

Motormaster III Control — Recommended mounting location is beneath the control box, mounted to the partition that separates the control box section from the indoor section.



NOTE: Dimensions in ( ) are in mm.

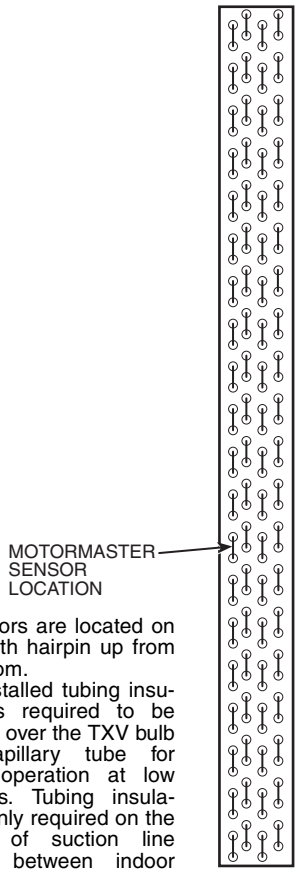
Fig. 25 — Wind Baffle Details

NOTE: If unit power is supplied through the roof curb and basepan of the unit, mount the Motormaster III control on the corner post adjacent to the conduit running from the basepan to the bottom of the control box.

X. STEP 10 — INSTALL HUMIDISTAT FOR OPTIONAL PERFECT HUMIDITY™ DEHUMIDIFICATION PACKAGE

Perfect Humidity dehumidification package operation can be controlled by field installation of a Bryant-approved humidistat. To install the humidistat perform the following procedure:

1. Locate humidistat on a solid interior wall in the conditioned space. Location should be a well ventilated area to sense average humidity.
2. Route thermostat cable or equivalent single leads of colored wire from humidistat terminals through conduit in unit to the low voltage connection on the 2-pole terminal strip (TB3) as shown in Fig. 27 and Fig. 28.



NOTES:
1. All sensors are located on the eighth hairpin up from the bottom.
2. Field-installed tubing insulation is required to be installed over the TXV bulb and capillary tube for proper operation at low ambients. Tubing insulation is only required on the portion of suction line located between indoor and outdoor section.

Fig. 26 — Motormaster® I and Motormaster III Sensor Locations

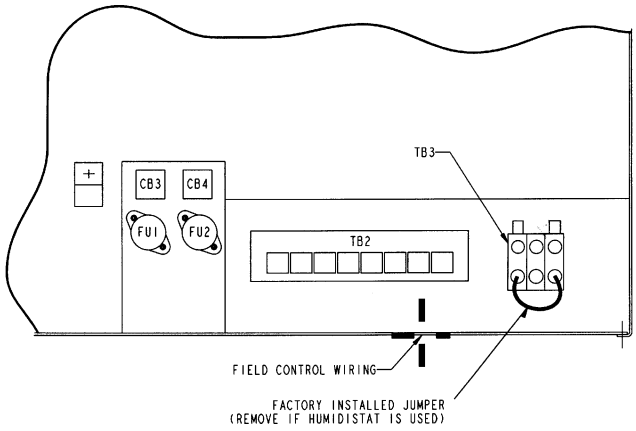
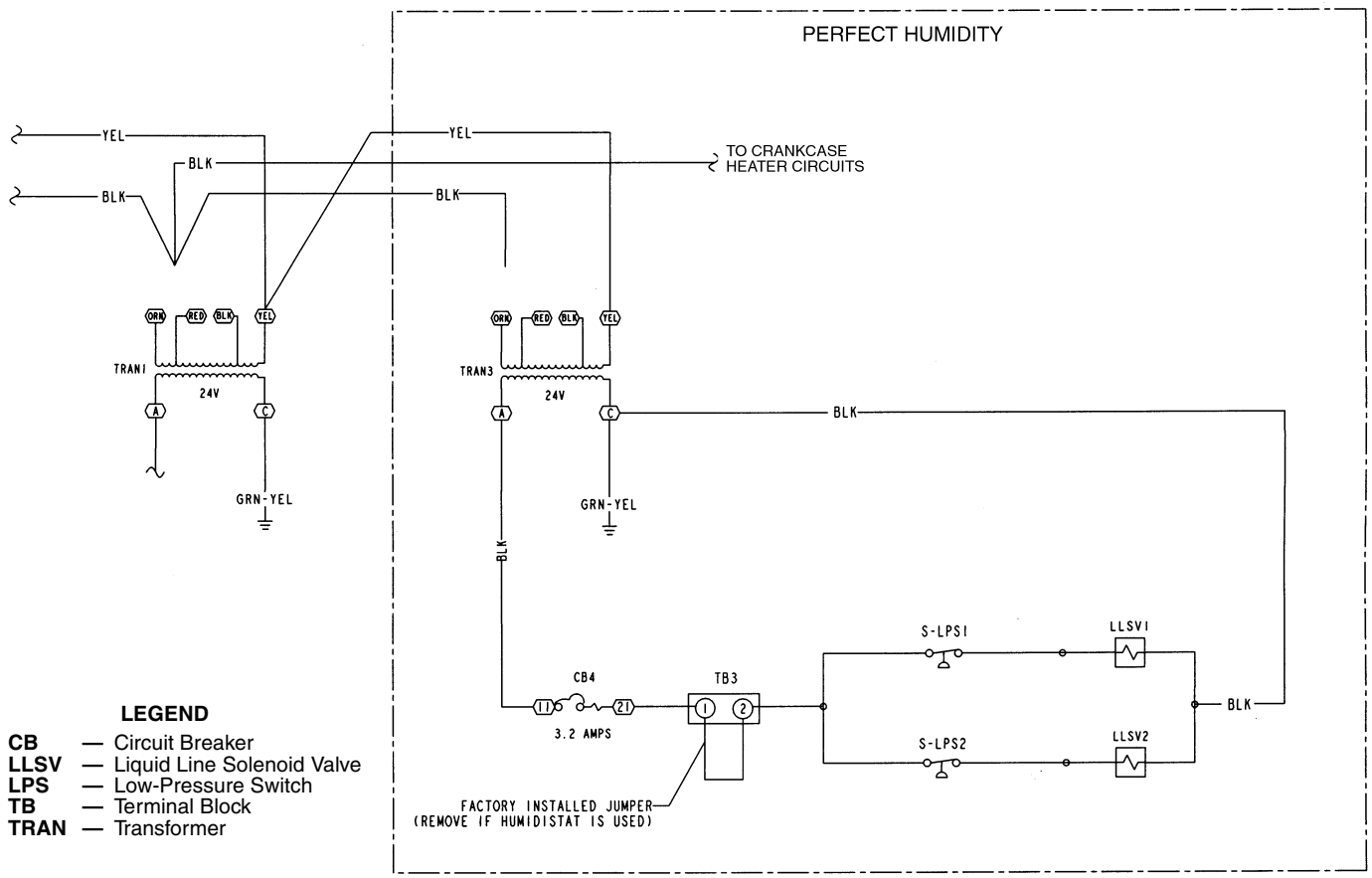


Fig. 28 — Typical Perfect Humidity Dehumidification Package Control Box



LEGEND

CB — Circuit Breaker
LLSV — Liquid Line Solenoid Valve
LPS — Low-Pressure Switch
TB — Terminal Block
TRAN — Transformer

Fig. 27 — Typical Perfect Humidify™ Dehumidification Package Humidistat Wiring Schematic (460V Unit Shown)

START-UP

Use the following information and Start-Up Checklist on page CL-1 to check out unit PRIOR to start-up.

I. UNIT PREPARATION

Check that unit has been installed in accordance with these installation instructions and all applicable codes.

II. COMPRESSOR MOUNTING

Compressors are internally spring mounted. Do not loosen or remove compressor holddown bolts.

III. REFRIGERANT SERVICE PORTS

Each refrigerant system has a total of 3 Schrader-type service gage ports. One port is located on the suction line, one on the compressor discharge line, and one on the liquid line. In addition Schrader-type valves are located underneath the low-pressure switches. Be sure that caps on the ports are tight.

IV. COMPRESSOR ROTATION

It is important to be certain the compressors are rotating in the proper direction. To determine whether or not compressors are rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit.
3. Reverse any two of the incoming power leads.
4. Turn on power to the compressor.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When compressors are rotating in the wrong direction, the unit will have increased noise levels and will not provide heating and cooling.

After a few minutes of reverse operation, the scroll compressor internal overload protection will open, which will activate the unit's lockout and requires a manual reset. Reset is accomplished by turning the thermostat on and off.

V. INTERNAL WIRING

Check all electrical connections in unit control boxes; tighten as required.

VI. CRANKCASE HEATERS

Heaters are energized as long as there is power to unit and compressor is not operating.

IMPORTANT: Unit power must be on for 24 hours prior to start-up. Otherwise, damage to compressor may result.

VII. EVAPORATOR FAN

Fan belt and variable pulleys are factory installed. Remove tape from the fan pulley. See Table 8 for Air Quantity Limits. See Tables 9-12 for Fan Performance data. Be sure that fans rotate in the proper direction. See Tables 13 and 14 for Static Pressure information for accessories and options. See Table 15 for fan rpm at various fan motor pulley settings. See Table 16 for Evaporator-Fan Motor Specifications. To alter fan performance, see Evaporator-Fan Performance Adjustment section, page 26.

Table 8 — Air Quantity Limits

UNIT 551A	MINIMUM CFM	MAXIMUM CFM
155	3600	6,000
180	4500	7,500
240	6000	10,000

VIII. CONDENSER FANS AND MOTORS

Condenser fans and motors are factory set. Refer to Condenser-Fan Adjustment section (page 28) as required. Be sure that fans rotate in the correct direction.

IX. RETURN-AIR FILTERS

Check that correct filters are installed in filter tracks. See Table 1. Do not operate unit without return-air filters.

X. OUTDOOR-AIR INLET SCREENS

Outdoor-air inlet screens must be in place before operating unit.

XI. ACCESSORY ECONOMI$ER ADJUSTMENT

Remove filter access panel. Check that outdoor-air damper blades are closed and return-air damper blades are open.

EconoMi$er operation and adjustment is described in Base Unit Operation and EconoMi$er Adjustment sections (this page and page 28), respectively.

XII. BASE UNIT OPERATION

A. Cooling, Units Without EconoMi$er

When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), and compressor contactor no. 1 (C1) are energized and evaporator-fan motor, compressor no. 1 and condenser fans start. The condenser-fan motors run continuously while unit is cooling. If the thermostat calls for a second stage of cooling by energizing Y2, compressor contactor no. 2 (C2) is energized and compressor no. 2 starts.

B. Heating, Units Without EconoMi$er (If Accessory or Optional Heater is Installed)

Upon a call for heating through terminal W1, IFC and heater contactor no. 1 (HC1) are energized. On units equipped for 2 stages of heat, when additional heat is needed, HC2 is energized through W2.

C. Cooling Units With EconoMi$er

When the OAT is above the ECON SP set point and the room thermostat calls for Stage 1 cooling (R to G + Y1), the indoor-fan motors (IFM) is energized and the EconoMi$er damper modulates to minimum position. The compressor contactor and OFC are energized to start the compressor and outdoor-fan motor (OFM). After the thermostat is satisfied, the damper modulates to the fully closed position when the IFM is deenergized.

When the OAT is below the ECON SP setting and the room thermostat calls for Stage 1 cooling (R to G + Y1), the EconoMi$er modulates to the minimum position when the IFM is energized. The EconoMi$er provides Stage 1 of cooling by modulating the return and outdoor air dampers to maintain a 55 F supply air set point. If the supply-air temperature (SAT) is greater than 57 F, the EconoMi$er modulates open, allowing a greater amount of outdoor air to enter the unit. If the SAT drops below 53 F, the outdoor air damper modulates closed to reduce the amount of outdoor air. When the SAT is between 53 and 57 F, the EconoMi$er maintains its position.

If outdoor air alone cannot satisfy the cooling requirements of the conditioned space, and the OAT is above the MECH CLG LOCKOUT set point, the EconoMi$er integrates free cooling with mechanical cooling. This is accomplished by the strategies below.

NOTE: Compressors have a two-minute Minimum On and Minimum Off, which are accomplished by the strategies below.

1. If Y1 is energized, and the room thermostat calls for Y2 (2-stage thermostat), the compressor and OFC are energized. The position of the EconoMi$er damper is maintained at its current value.
2. If Y1 is energized for more than 20 minutes, and Y2 is not energized (whether or not a 2-stage thermostat is used), the compressor and OFC are energized. The position of the EconoMi$er damper is maintained at its current value.
3. If Y1 is energized, and compressor no. 1 is already energized (see Step 2) and the room thermostat calls for Y2, compressor no. 1 continues to operate. If Y2 remains energized for more than 20 minutes, compressor no. 2 is energized.

NOTE: Compressor no. 2 cannot be energized unless there is a signal for Y2 from the space thermostat.

4. If compressor no. 2 is energized, and the Y2 signal from the thermostat is satisfied, compressors 1 and 2 are deenergized. Re-asserting Y2 will start compressor no. 1 and (after a 20-minute interstage delay) compressor no. 2.
5. If compressor no. 1 is energized and the thermostat is satisfied, compressor no. 1, the OFM, and IFM are deenergized and the EconoMi$er modulates closed.

When the OAT is below the MECH CLG LOCKOUT set point, the compressors remain off.

D. Freeze Protection Thermostat(s)

A freeze protection thermostat (FPT) is located on the top and bottom of the evaporator coil. It detects frost build-up and turns off the compressor, allowing the coil to clear. Once frost has melted, the compressor can be reenergized by resetting the compressor lockout.

E. Heating, Units With EconoMi$er (If Accessory or Optional Heater is Installed)

When the room thermostat calls for heat, the heating controls are energized as described in the Heating, Units Without EconoMi$er section. The IFM is energized and the EconoMi$er damper modulates to the minimum position. When the thermostat is satisfied, the damper modulates closed.

F. Units With Perfect Humidity™ Dehumidification Package

When thermostat calls for cooling, terminals G and Y1 and/or Y2 and the compressor contactor C1 and/or C2 are energized. The indoor (evaporator) fan motor (IFM), compressors, and outdoor (condenser) fan motors (OFM) start. The OFMs run continuously while the unit is in cooling. As shipped from the factory, both Perfect Humidity dehumidification circuits are always energized.

If Perfect Humidity circuit modulation is desired, a field-installed, wall-mounted humidistat is required. If the Perfect Humidity humidistat is installed and calls for the Perfect Humidity subcooler coil to operate, the humidistat internal switch closes. This energizes the 3-way liquid line solenoid valve coils (LLSV1 for circuit 1 and LLSV2 for circuit 2) of the Perfect Humidity circuits, forcing the warm liquid refrigerant of the liquid line to enter the subcooler coils. See Fig. 29.

As the warm liquid passes through the subcooler coils, it is exposed to the cold supply airflow coming off the evaporator coils and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coils is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to the evaporator pressure. The TXVs can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valves over a wide range of operating conditions. The liquid proceeds to the evaporator coils at a temperature lower than normal cooling operation. This lower temperature is what increases the latent and sensible capacity of the evaporator coils.

The 2-phase refrigerant passes through the evaporators and is changed into a vapor. The air passing over the evaporator coils will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coils, the air will be warmed, decreasing the sensible capacity and reducing the sensible heat of the roof- top unit.

As the refrigerant leaves the evaporator, the refrigerant passes a subcooler control low-pressure switch (S-LPS1 for circuit 1 or S-LPS2 for circuit 2) in the suction line. This low-pressure switch will deactivate the Perfect Humidity package when the suction pressure reaches 60 psig. The subcooler control low-pressure switch is an added safety device to protect against evaporator coil freeze-up during low ambient operation. The subcooler control low-pressure switch will only deactivate the 3-way liquid line solenoid valve in the Perfect Humidity circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the subcooler control low-pressure switch. The 3-way solenoid valve and the Perfect Humidity package will be reactivated only when the call for cooling has been satisfied, the subcooler control low-pressure switch has closed above 80 psig, and a new call for cooling exists. The crankcase heaters on the scroll compressors provide additional protection for the compressors due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens, cutting power to and deenergizing the LLSVs. The refrigerant is routed back through the evaporators and the subcooler coils are removed from the refrigerant loops. When the thermostat is satisfied, C1 and C2 are deenergized and the compressors, IFM, and OFMs shut off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

Table 9 — Fan Performance — 551A155 (With Standard Indoor Fan Motor)

551A155 (12 TONS)*															
Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	753	915	1.05	786	972	1.12	892	1170	1.35	991	1378	1.58	1084	1595	1.83
4000	747	977	1.12	810	1090	1.25	911	1292	1.49	1007	1503	1.73	1097	1723	1.98
4250	741	1041	1.20	835	1220	1.40	932	1426	1.64	1024	1640	1.89	1111	1863	2.14
4500	761	1158	1.33	861	1360	1.56	954	1570	1.81	1043	1788	2.06	1127	2014	2.32
4750	792	1305	1.50	887	1512	1.74	977	1726	1.99	1063	1948	2.24	1145	2177	2.50
5000	823	1464	1.68	915	1676	1.93	1002	1894	2.18	1084	2120	2.44	1164	2352	2.70
5250	855	1635	1.88	943	1852	2.13	1027	2075	2.39	1107	2304	2.65	1184	2539	2.92
5500	887	1819	2.09	972	2041	2.35	1053	2268	2.61	1130	2501	2.88	—	—	—
5750	920	2016	2.32	1002	2242	2.58	1079	2473	2.84	—	—	—	—	—	—
6000	953	2226	2.56	1031	2457	2.83	1107	2692	3.10	—	—	—	—	—	—
6250	986	2449	2.82	1062	2685	3.09	—	—	—	—	—	—	—	—	—

551A155 (12 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	1172	1822	2.10	1256	2057	2.37	1337	2299	2.64	1414	2549	2.93	—	—	—
4000	1182	1952	2.24	1264	2188	2.52	1343	2432	2.80	1418	2683	3.09	—	—	—
4250	1194	2093	2.41	1274	2332	2.68	1351	2577	2.96	—	—	—	—	—	—
4500	1208	2247	2.58	1286	2487	2.86	—	—	—	—	—	—	—	—	—
4750	1223	2412	2.77	1299	2655	3.05	—	—	—	—	—	—	—	—	—
5000	1240	2590	2.98	—	—	—	—	—	—	—	—	—	—	—	—
5250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard low-medium static drive range is 834 to 1064 rpm. Alternate high-static drive range is 1161 to 1426. Other rpms require a field-supplied drive.

NOTES:

1. Maximum continuous bhp for the standard motor is 3.13. The maximum continuous watts is 2700. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$er) must be added to external static pressure before entering Fan Performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing losses. See Table 13 for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full bhp and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Bryant representative for details.

Table 10 — Fan Performance — 551A155 (With Optional Indoor Fan Motor)

551A155 (12 TONS)*															
Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	753	942	1.08	786	998	1.15	892	1192	1.37	991	1395	1.60	1084	1606	1.85
4000	747	1006	1.16	810	1118	1.29	911	1315	1.51	1007	1520	1.75	1097	1733	1.99
4250	741	1073	1.23	835	1248	1.44	932	1448	1.67	1024	1657	1.91	1111	1872	2.15
4500	761	1191	1.37	861	1389	1.60	954	1593	1.83	1043	1804	2.07	1127	2022	2.33
4750	792	1339	1.54	887	1541	1.77	977	1749	2.01	1063	1963	2.26	1145	2183	2.51
5000	823	1499	1.72	915	1705	1.96	1002	1916	2.20	1084	2133	2.45	1164	2356	2.71
5250	855	1671	1.92	943	1880	2.16	1027	2095	2.41	1107	2316	2.66	1184	2541	2.92
5500	887	1854	2.13	972	2068	2.38	1053	2286	2.63	1130	2510	2.89	1205	2739	3.15
5750	920	2050	2.36	1002	2268	2.61	1079	2490	2.86	1154	2717	3.12	1227	2948	3.39
6000	953	2258	2.60	1031	2480	2.85	1107	2706	3.11	1179	2936	3.38	1249	3171	3.65
6250	986	2480	2.85	1062	2706	3.11	1135	2935	3.38	1205	3169	3.64	1273	3406	3.92

551A155 (12 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	1172	1825	2.10	1256	2051	2.36	1337	2284	2.63	1414	2523	2.90	1488	2768	3.18
4000	1182	1954	2.25	1264	2181	2.51	1343	2415	2.78	1418	2655	3.05	1491	2901	3.34
4250	1194	2094	2.41	1274	2323	2.67	1351	2558	2.94	1424	2799	3.22	1496	3045	3.50
4500	1208	2246	2.58	1286	2476	2.85	1360	2713	3.12	1432	2955	3.40	1502	3202	3.68
4750	1223	2410	2.77	1299	2642	3.04	1371	2880	3.31	1442	3123	3.59	1510	3372	3.88
5000	1240	2585	2.97	1313	2819	3.24	1384	3059	3.52	1453	3304	3.80	1520	3554	4.09
5250	1258	2773	3.19	1329	3009	3.46	1398	3250	3.74	1465	3497	4.02	1530	3748	4.31
5500	1276	2972	3.42	1346	3211	3.69	1413	3455	3.97	1479	3703	4.26	—	—	—
5750	1296	3185	3.66	1364	3426	3.94	1430	3671	4.22	—	—	—	—	—	—
6000	1317	3410	3.92	1383	3653	4.20	—	—	—	—	—	—	—	—	—
6250	1339	3648	4.20	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard low-medium static drive range is 834 to 1064 rpm. Alternate high-static drive range is 1161 to 1426. Other rpms require a field-supplied drive.

NOTES:

1. Maximum continuous bhp for the optional motor is 4.38. The maximum continuous watts is 3775. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$er) must be added to external static pressure before entering Fan Performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing losses. See Table 13 for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full bhp and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Bryant representative for details.

Table 11 — Fan Performance — 551A180

551A180 (15 TONS)*															
Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	753	1307	1.53	753	1307	1.53	784	1397	1.64	859	1635	1.92	928	1880	2.20
4800	747	1384	1.62	747	1384	1.62	806	1563	1.83	878	1808	2.12	946	2060	2.42
5100	741	1465	1.72	752	1500	1.76	828	1745	2.05	898	1996	2.34	964	2255	2.65
5700	735	1659	1.95	805	1895	2.22	876	2156	2.53	942	2423	2.84	1004	2696	3.16
6000	759	1854	2.18	832	2118	2.48	901	2388	2.80	965	2663	3.12	1026	2943	3.45
6300	790	2088	2.45	860	2360	2.77	926	2638	3.09	988	2920	3.43	1048	3208	3.76
6600	821	2340	2.74	888	2621	3.07	952	2906	3.41	1013	3196	3.75	1070	3491	4.10
6900	852	2611	3.06	917	2900	3.40	979	3194	3.75	1038	3492	4.10	1094	3794	4.45
7200	883	2903	3.40	946	3200	3.75	1006	3501	4.11	1063	3807	4.47	1118	4117	4.83
7500	914	3215	3.77	975	3521	4.13	1033	3830	4.49	1089	4143	4.86	1142	4461	5.23

551A180 (15 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	993	2133	2.50	1055	2394	2.81	1114	2662	3.12	1170	2938	3.45	1224	3220	3.78
4800	1009	2319	2.72	1070	2585	3.03	1127	2859	3.35	1183	3139	3.68	1236	3427	4.02
5100	1026	2521	2.96	1086	2794	3.28	1142	3073	3.60	1196	3359	3.94	1248	3650	4.28
5700	1064	2975	3.49	1120	3260	3.82	1174	3551	4.17	1226	3848	4.51	1277	4151	4.87
6000	1083	3228	3.79	1139	3520	4.13	1192	3817	4.48	1243	4119	4.83	1292	4427	5.19
6300	1104	3501	4.11	1158	3799	4.46	1210	4102	4.81	1260	4410	5.17	1309	4724	5.54
6600	1125	3791	4.45	1178	4095	4.80	1229	4405	5.17	1278	4720	5.54	1326	5039	5.91
6900	1147	4101	4.81	1199	4412	5.18	1249	4728	5.55	1297	5050	5.92	—	—	—
7200	1170	4431	5.20	1221	4749	5.57	1270	5072	5.95	—	—	—	—	—	—
7500	1193	4781	5.61	1243	5107	5.99	—	—	—	—	—	—	—	—	—

551A180 (15 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1276	3509	4.12	1326	3805	4.46	1375	4107	4.82	1421	4414	5.18	1467	4728	5.55
4800	1287	3721	4.36	1336	4020	4.72	1384	4326	5.07	1430	4638	5.44	1475	4955	5.81
5100	1299	3949	4.63	1347	4253	4.99	1395	4563	5.35	1440	4879	5.72	—	—	—
5700	1325	4458	5.23	1373	4772	5.60	1418	5091	5.97	—	—	—	—	—	—
6000	1340	4741	5.56	1387	5060	5.93	—	—	—	—	—	—	—	—	—
6300	1356	5043	5.91	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard low-medium static drive range is 873 to 1021 rpm. Alternate high-static drive range is 1025 to 1200. Other rpms require a field-supplied drive.

NOTES:

1. Maximum continuous bhp for the standard motor is 6.13. The maximum continuous watts is 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$er) must be added to external static pressure before entering Fan Performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing losses. See Table 13 for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full bhp and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Bryant representative for details.

Table 12 — Fan Performance — 551A240

551A240 (20 TONS)*															
Cfm	Available External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	753	2385	2.83	816	2579	3.06	884	2807	3.33	949	3040	3.61	1010	3277	3.89
6,500	793	2738	3.25	861	2959	3.51	925	3186	3.78	987	3418	4.05	1045	3653	4.33
7,000	844	3151	3.74	908	3372	4.00	968	3598	4.27	1026	3828	4.54	1082	4062	4.82
7,500	895	3596	4.27	955	3817	4.53	1013	4042	4.80	1068	4271	5.07	1121	4504	5.34
8,000	947	4073	4.83	1004	4294	5.09	1058	4518	5.36	1111	4747	5.63	1162	4978	5.91
8,500	999	4583	5.44	1053	4803	5.70	1105	5027	5.96	1155	5255	6.23	1204	5485	6.51
9,000	1052	5125	6.08	1103	5345	6.34	1152	5569	6.61	1200	5796	6.88	1247	6025	7.15
9,500	1105	5699	6.76	1153	5919	7.02	1200	6142	7.29	1246	6369	7.56	1291	6598	7.83
10,000	1158	6306	7.48	1204	6526	7.74	1249	6750	8.01	1293	6975	8.27	1336	7203	8.55

551A240 (20 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1069	3517	4.17	1125	3761	4.46	1180	4006	4.75	1232	4255	5.05	1283	4506	5.35
6,500	1102	3891	4.62	1156	4132	4.90	1208	4377	5.19	1259	4623	5.48	1308	4871	5.78
7,000	1136	4299	5.10	1188	4538	5.38	1239	4780	5.67	1288	5025	5.96	1335	5271	6.25
7,500	1173	4739	5.62	1223	4977	5.90	1272	5217	6.19	1319	5460	6.48	1365	5705	6.77
8,000	1211	5212	6.18	1259	5449	6.46	1306	5688	6.75	1352	5929	7.03	1396	6172	7.32
8,500	1251	5718	6.78	1297	5954	7.06	1342	6192	7.35	1386	6431	7.63	1429	6673	7.92
9,000	1292	6257	7.42	1337	6492	7.70	1380	6729	7.98	1423	6967	8.27	1464	7207	8.55
9,500	1335	6830	8.10	1377	7063	8.38	1419	7299	8.66	1460	7536	8.94	1501	7776	9.22
10,000	1378	7434	8.82	1419	7667	9.10	1460	7902	9.37	1499	8138	9.65	1538	8377	9.94

551A240 (20 TONS) (cont)*															
Cfm	Available External Static Pressure (in. wg)														
	2.2			2.4			2.6			2.8			3.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,000	1332	4750	5.65	1380	5015	5.95	1427	5272	6.25	1472	5531	6.56	1517	5793	6.87
6,500	1356	5122	6.08	1402	5375	6.38	1447	5630	6.68	1492	5886	6.98	1535	6144	7.29
7,000	1381	5519	6.55	1427	5770	6.84	1471	6022	7.14	1514	6276	7.45	—	—	—
7,500	1409	5951	7.06	1453	6199	7.35	1496	6449	7.65	1538	6701	7.95	—	—	—
8,000	1440	6417	7.61	1482	6663	7.90	1523	6911	8.20	—	—	—	—	—	—
8,500	1471	6916	8.20	1513	7161	8.49	—	—	—	—	—	—	—	—	—
9,000	1505	7449	8.84	1545	7693	9.13	—	—	—	—	—	—	—	—	—
9,500	1540	8016	9.51	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard low-medium static drive range is 1002 to 1151 rpm. Alternate high-static drive range is 1193 to 1369. Other rpms require a field-supplied drive.

NOTES:

1. Maximum continuous bhp for the standard motor is 9.47 (for 208-v units) and 10.33 (for 230 and 460-v units). The maximum continuous watts is 7915 (for 208-v units) and 8640 (for 230 and 460-v units). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$er) must be added to external static pressure before entering Fan Performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing losses. See Table 13 for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full bhp and watts range of the motor can be utilized with confidence. Using your fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Bryant representative for details.

Table 13 — Accessory/FIOP Static Pressure (in. wg)

UNIT 551A	HEATER RATED VOLTAGE	CFM	ELECTRIC HEATERS PRESSURE DROP (kW)			ECONOMI$ER PRESSURE DROP
155,180	208/240-3-60	3,750	0.05 (14/19, 26/34)	0.06 (42/56)	0.07 (56/75)	0.03
		4,000	0.05 (14/19, 26/34)	0.06 (42/56)	0.07 (56/75)	0.04
		5,000	0.07 (14/19, 26/34)	0.08 (42/56)	0.10 (56/75)	0.05
		6,000	0.09 (14/19, 26/34)	0.12 (42/56)	0.15 (56/75)	0.07
		7,200	0.11 (14/19, 26/34)	0.16 (42/56)	0.20 (56/75)	0.09
		7,500	0.12 (14/19, 26/34)	0.17 (42/56)	0.21 (56/75)	0.10
	480-3-60	3,750	0.05 (15, 32)	0.06 (55)	0.07 (80)	0.03
		4,000	0.05 (15, 32)	0.06 (55)	0.07 (80)	0.04
		5,000	0.07 (15, 32)	0.08 (55)	0.10 (80)	0.05
		6,000	0.09 (15, 32)	0.12 (55)	0.15 (80)	0.07
		7,200	0.11 (15, 32)	0.15 (55)	0.20 (80)	0.09
		7,500	0.12 (15, 32)	0.17 (55)	0.21 (80)	0.10
240	208/240-3-60	5,000	0.08 (26/34)	0.11 (42/56)	0.14 (56/75)	0.06
		6,000	0.09 (26/34)	0.12 (42/56)	0.15 (56/75)	0.07
		7,200	0.11 (26/34)	0.16 (42/56)	0.20 (56/75)	0.09
		9,000	0.15 (26/34)	0.19 (42/56)	0.24 (56/75)	0.11
		10,000	0.17 (26/34)	0.21 (42/56)	0.26 (56/75)	0.12
		11,250	0.20 (26/34)	0.24 (42/56)	0.29 (56/75)	0.14
	480-3-60	5,000	0.08 (32)	0.11 (55)	0.14 (80)	0.06
		6,000	0.09 (32)	0.12 (55)	0.15 (80)	0.07
		7,200	0.11 (32)	0.15 (55)	0.20 (80)	0.09
		9,000	0.15 (32)	0.19 (55)	0.24 (80)	0.11
		10,000	0.17 (32)	0.21 (55)	0.26 (80)	0.12
		11,250	0.20 (32)	0.24 (55)	0.29 (80)	0.14

LEGEND

FIOP — Factory-Installed Option

NOTES:
1. Heaters are rated at 240 v, and 480 v.
2. The factory assembled horizontal adapter substantially improves fan performance.
3. The static pressure must be added to external static pressure. The sum and the evaporator entering-air cfm should then be used in conjunction with the Fan Performance table to determine blower rpm, bhp, and watts.

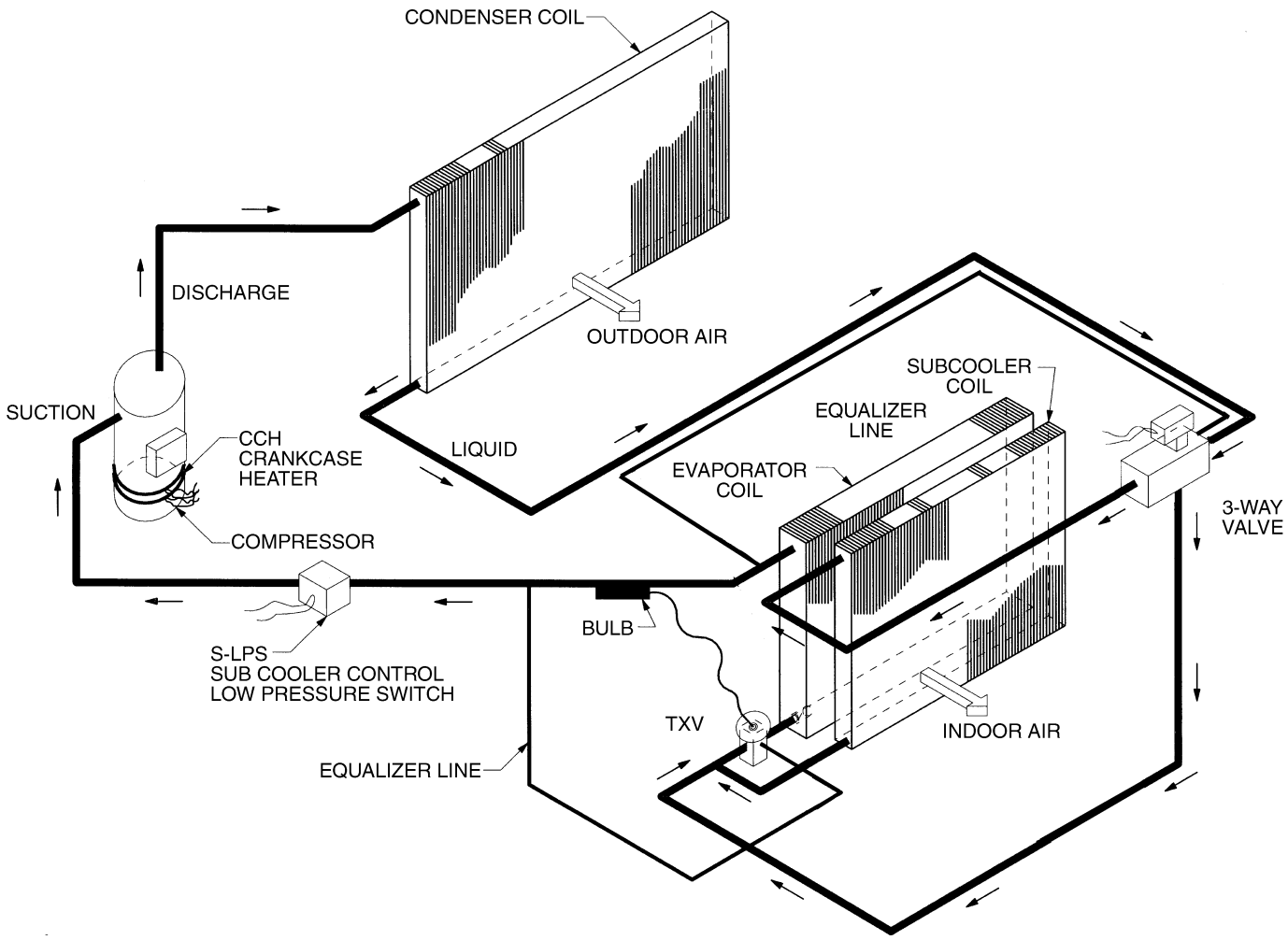


Fig. 29 — Perfect Humidity™ Operation Diagram

Table 14 — Perfect Humidity™ Dehumidification Package Static Pressure Drop (in. wg)

UNIT SIZE 551A	UNIT NOMINAL TONS	CFM PER TON		
		300	400	500
155	12	.026	.045	.071
180	15	.040	.071	.111
240	20	.071	.126	.197

Table 15 — Fan RPM at Motor Pulley Settings*

551A	0	0.5	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
155†	††	††	††	††	1064	1035	1006	978	949	920	891	863	834
155**	††	††	††	††	1426	1393	1360	1327	1294	1261	1227	1194	1161
180†	††	††	††	††	1021	1002	984	965	947	928	910	891	873
180**	††	††	††	††	1200	1178	1156	1134	1112	1091	1069	1047	1025
240†	††	††	††	††	1151	1132	1114	1095	1077	1058	1040	1021	1002
240**	††	††	††	††	1369	1347	1325	1303	1281	1259	1237	1215	1193

*Approximate fan rpm shown.
†Indicates standard drive package.
**Indicates alternate drive package.
††Due to belt and pulley style, pulley cannot be set to this number of turns open.

Table 16 — Evaporator Fan Motor Specifications

UNIT 551A	NOMINAL HP	VOLTAGE	MAX WATTS	EFF. %	MAX BHP	MAX BkW	MAX AMPS
155 (Standard Motor)	2.9 2.9 2.9	208 230 460	2700 2700 2700	85.8 85.8 85.8	3.13 3.13 3.13	2.34 2.34 2.34	9.46 8.6 4.3
155 (Optional Motor)	3.7 3.7 3.7	208 230 460	3775 3775 3775	85.8 85.8 85.8	4.38 4.38 4.38	3.27 3.27 3.27	10.5 10.5 4.8
180	5 5 5	208 230 460	5180 5180 5180	87.5 87.5 87.5	6.13 6.13 6.13	4.57 4.57 4.57	15.8 15.8 7.9
240	7.5 7.5 7.5	208 230 460	7915 8640 8640	88.5 88.5 88.5	9.47 10.33 10.33	7.06 7.71 7.71	22 22 13

LEGEND

BHP — Brake Horsepower

SERVICE

⚠ **WARNING:** Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag on disconnect switch. Turn off accessory heater power switch if applicable. Electrical shock could cause personal injury.

I. CLEANING

Inspect unit interior at beginning of each heating and cooling season and as operating conditions require. Remove unit top panel and/or side panels for access to unit interior.

A. Evaporator Coil

Clean as required with a commercial coil cleaner.

B. Condenser Coil

Clean condenser coil annually and as required by location and outdoor-air conditions. Inspect coil monthly — clean as required.

C. Condensate Drain

Check and clean each year at start of cooling season. In winter, keep drains and trap dry.

D. Filters

Clean or replace at start of each heating and cooling season, or more often if operating conditions require. Refer to Table 1 for type and size.

E. Outdoor-Air Inlet Screens

Clean screens with steam or hot water and a mild detergent. Do not use throwaway filters in place of screens.

II. LUBRICATION

A. Compressors

Each compressor is charged with the correct amount of oil at the factory. Conventional white oil (Sontext 200LT) is used. White oil is compatible with 3GS oil, and 3GS oil may be used if the addition of oil is required. See compressor nameplate for original oil charge. A complete recharge should be four ounces less than the original oil charge. When a compressor is exchanged in the field it is possible that a major portion of the oil from the replaced compressor may still be in the system. While this will not affect the reliability of the replacement compressor, the extra oil will add rotor drag and increase power usage. To remove this excess oil, an access valve may be added to the lower portion of the suction line at the inlet of the compressor. The compressor should then be run for 10 minutes, shut down, and the access valve opened until no oil flows. This should be repeated twice to make sure the proper oil level has been achieved.

B. Fan Shaft Bearings

For size 155 units, bearings are permanently lubricated. No field lubrication is required. For size 180 and 240 units, the bearings are of the pillow block type and have grease fittings. The bearing opposite the motor end has an extended tube line so it can be lubricated from the motor side. Lubricate the bearings twice annually.

Typical lubricants are given below:

MANUFACTURER	LUBRICANT
Texaco	Regal AFB-2*
Mobil	Mobilplex EP No. 1
Sunoco	Prestige 42
Texaco	Multifak 2

*Preferred lubricant because it contains rust and oxidation inhibitors.

C. Condenser and Evaporator-Fan Motor Bearings

The condenser and evaporator-fan motors have permanently sealed bearings, so no field lubrication is necessary.

III. EVAPORATOR FAN PERFORMANCE ADJUSTMENT (Fig. 30-32)

Fan motor pulleys are factory set for speed shown in Table 1.

To change fan speeds:

1. Shut off unit power supply.
2. a. Size 155 Only: Loosen belt by loosening fan motor mounting plate nuts.
   b. Size 180 and 240 Only: Loosen nuts on the 2 carriage bolts in the motor mounting base. Install jacking bolt and plate under motor base (bolt and plate are shipped in installer's packet). See Fig. 32. Using bolt and plate, raise motor to top of slide and remove belt. Secure motor in this position by tightening the nuts on the carriage bolts.
3. Loosen movable-pulley flange setscrew (see Fig. 30).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.

   See Table 8 for air quantity limits.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 1 for speed change for each full turn of pulley flange.)
6. Replace and tighten belts. See Belt Tension Adjustment section on page 27.

To align fan and motor pulleys:

1. Loosen fan pulley setscrews.
2. Slide fan pulley along fan shaft.
3. Make angular alignment by loosening motor from mounting plate.

IV. EVAPORATOR FAN SERVICE AND REPLACEMENT

A. 551A155 Units (See Fig. 31)

NOTE: To remove belts only, follow Steps 1-6.

1. Remove filter and supply-air section panels.
2. Remove unit top panel.
3. Loosen carriage nuts A and B holding motor mount assembly to fan scroll side plates.
4. Loosen screw C.
5. Rotate motor mount assembly (with motor attached) as far as possible away from evaporator coil.
6. Remove belt.
7. Rotate motor mount assembly back past original position toward evaporator coil.
8. Remove motor mounting nuts D and E (both sides).
9. Lift motor up through top of unit.
10. Reverse above procedure to reinstall motor.
11. Check and adjust belt tension as necessary.

B. 551A180,240 Units (See Fig. 32)

The 551A180,240 units use a fan motor mounting system that features a slide-out motor mounting plate. To replace or service the motor, slide out the bracket.

1. Remove the evaporator-fan access panel and the heating control access panel.
2. Remove the center post (located between the evaporator fan and heating control access panels) and all screws securing it.

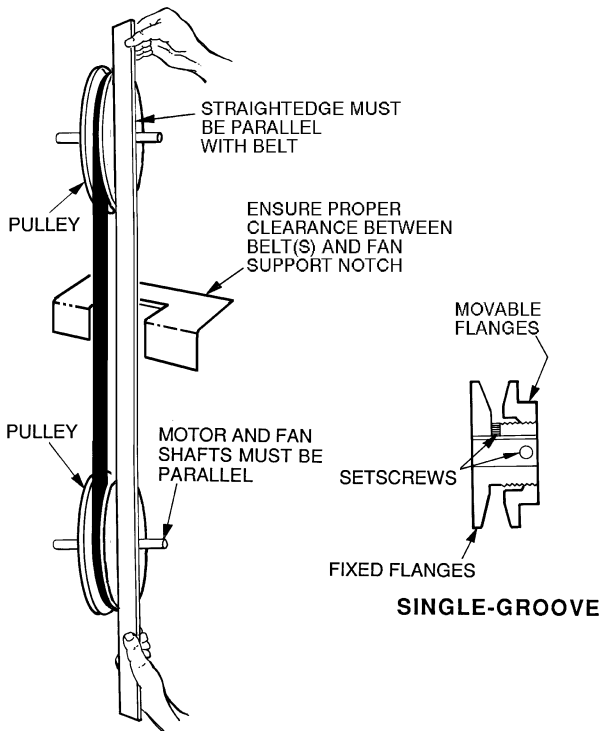


Fig. 30 — Evaporator-Fan Pulley Alignment and Adjustment

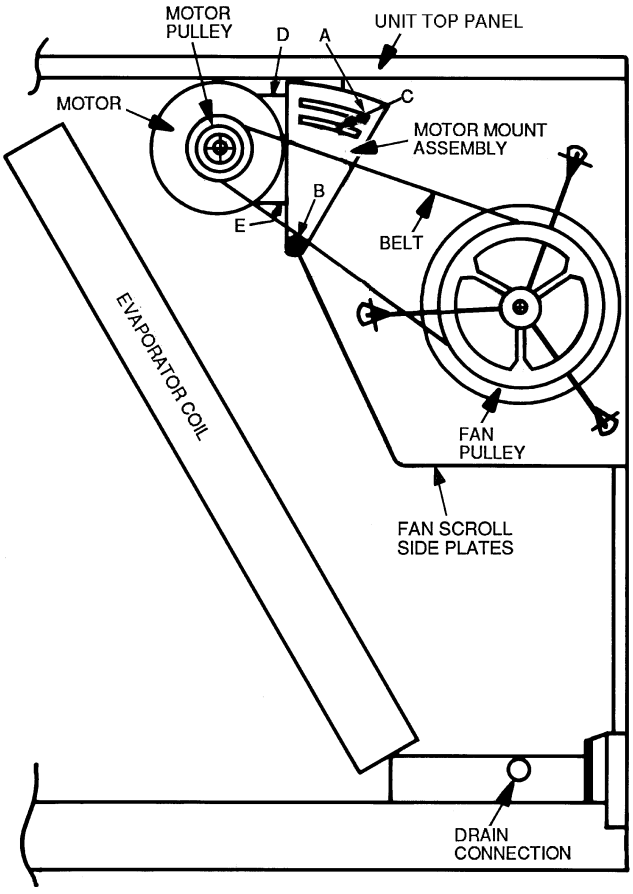
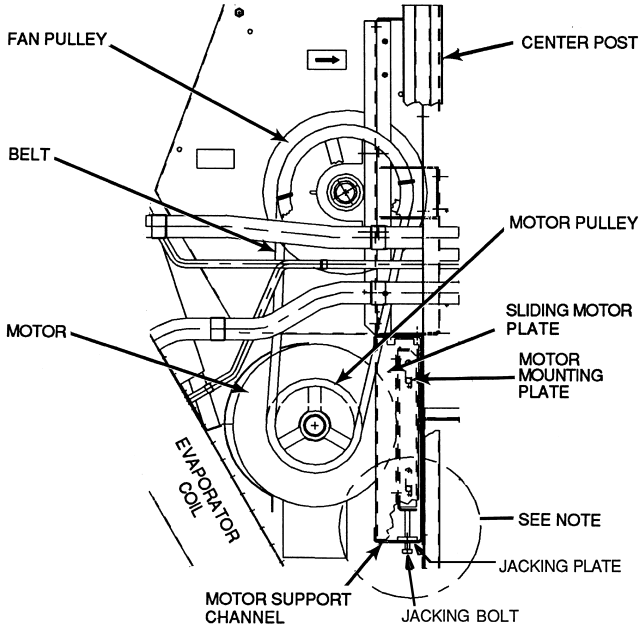


Fig. 31 — 551A155 Evaporator-Fan Motor Section

3. Loosen nuts on the two carriage bolts in the motor mounting base.
4. Using jacking bolt under motor base, raise motor to top of slide and remove belt. Secure motor in this position by tightening the nuts on the carriage bolts.
5. Remove the belt drive.
6. Remove jacking bolt and tapped jacking bolt plate.
7. Remove the 2 screws that secure the motor mounting plate to the motor support channel.
8. Remove the 3 screws from the end of the motor support channel that interfere with the motor slide path.
9. Slide out the motor and motor mounting plate.
10. Disconnect wiring connections and remove the 4 mounting bolts.
11. Remove the motor.
12. To install the new motor, reverse Steps 1-11.



NOTE: A $3^1/_2$-in. bolt and threaded plate are included in the installer's packet. They should be added to the motor support channel below the motor mounting plate to aid in raising the motor. The plate part number is 50DP503842. The adjustment bolt is $^3/_8$- 16 x $2^1/_2$ LG.

Fig. 32 — 551A180,240 Evaporator-Fan Motor Section

V. BELT TENSION ADJUSTMENT

To adjust belt tension:

1. Loosen fan motor bolts.
2. Adjust belt tension:
   a. Size 155 Units: Move motor mounting plate up or down for proper belt tension ($^1/_2$ in. deflection with one finger).
   b. Size 180, 240 Units: Turn motor jacking bolt to move motor mounting plate up or down for proper belt tension ($^3/_8$ in. deflection at midspan with one finger [9 lb force]).
3. Tighten nuts.
4. Adjust bolts and nut on mounting plate to secure motor in fixed position.

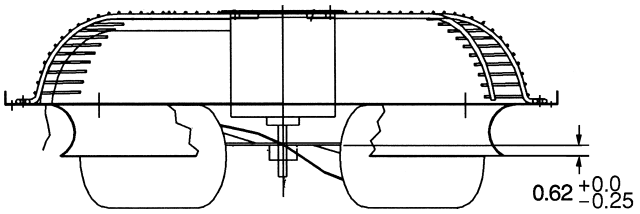
VI. CONDENSER-FAN ADJUSTMENT

A. 551A155 and 180 Units (Fig. 33)

1. Shut off unit power supply.
2. Remove access panel(s) closest to the fan to be adjusted.
3. Loosen fan hub setscrews.
4. Adjust fan height on shaft using a straightedge placed across the fan orifice.
5. Tighten setscrews and replace panel(s).
6. Turn on unit power.

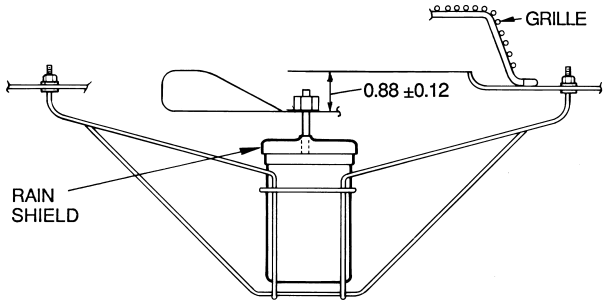
B. 551A240 Units (Fig. 34)

1. Shut off unit power supply.
2. Remove fan top-grille assembly and loosen fan hub screws.
3. Adjust fan height on unit, using a straightedge placed across the fan orifice.
4. Tighten setscrews and replace rubber hubcap to prevent hub from rusting to motor shaft.
5. Fill hub recess with permagum if rubber hubcap is missing.



NOTE: Dimensions are in inches).

Fig. 33 — Condenser-Fan Adjustment, 551A155,180



NOTE: Dimensions are in inches.

Fig. 34 — Condenser-Fan Adjustment, 551A240

VII. ECONOMI$ER ADJUSTMENT

A. LED Indication

The EconoMi$er controller features an onboard diagnostic LED (light-emitting diode) that flashes to indicate its status. See Table 17 for flash codes. The controller also has terminal connections (REM LED) for remotely mounting an LED, if desired. The flash code priorities are as follows:

1. On/Off or continuous flash
2. Critical fault
3. Non-critical fault

If any sensors are opened, shorted, or removed, the EconoMi$er determines whether the failure is critical or non-critical and flashes the appropriate code. If a non-critical sensor fault occurs (i.e., outdoor air humidity), the EconoMi$er automatically reconfigures its control strategy to a more appropriate mode. If a critical sensor fault occurs (i.e., supply air sensor), the EconoMi$er reverts to a safe mode of operation until the sensor problem is resolved.

B. Manual Configuration Pushbutton

The EconoMi$er controller also features an onboard button (CONFIG) to help troubleshoot the system. See Fig. 16. The button can perform 3 different functions.

Pressing the CONFIG button for more than three seconds, but less than ten seconds and then releasing will start the automatic test procedure. The damper will modulate fully open, wait, and modulate closed. This process takes three minutes to complete. Use this feature to determine if the actuator can be commanded.

If the CONFIG button is pressed and held for ten seconds and less than 30 seconds then released, the EconoMi$er controller reconfigures its mode of operation based on the sensors that are connected and functioning normally, and cancels the automatic test procedure.

If the EconoMi$er controller recognized a non-critical sensor fault, and flashed a code (i.e., FLASH 6, outdoor air humidity sensor fault) the FLASH CODE will be cleared, and normal operation begins. Ensure faulty sensor is removed before clearing faults.

If the EconoMi$er controller recognizes a critical sensor fault, and flashes a code (i.e., FLASH 4, discharge air thermostat fault) the FLASH code will not be cleared, and the EconoMi$er will remain in the safe operation mode. The sensor fault must be corrected to enable EconoMi$er to revert to normal operation.

Table 17 — EconoMi$er Control Module Flash Code Identification

	FLASH CODE	CAUSE	ACTION TAKEN BY ECONOMI$ER
	Constant On	Normal operation	Normal operation.
	Constant Off	No power	No operation.
	Continuous Flash	CONFIG button pushed and held between 3 and 9 seconds	Outdoor air damper is stroked fully open, then closed (automatic test procedure takes 3 minutes to complete).
Critical Fault	**Flash One**	Control board fault	System shutdown.
	Flash Two	Thermostat fault (i.e., Y2 without Y1)	System shutdown until corrected.
	Flash Three	Actuator fault	Revert to mechanical cooling only.
	Flash Four	Discharge air thermistor fault	Continue operation with damper at minimum position. Revert to mechanical cooling only.
	Flash Five	Outdoor air temperature sensor fault	Continue operation with damper at minimum position. Disable mechanical cooling lockout.
Non-Critical Fault	**Flash Six**	Outdoor air humidity sensor fault	Continue operation with dry bulb or dry bulb differential switchover.
	Flash Seven	Return air temperature sensor fault	Continue operation with single enthalpy EconoMi$er switchover or dry bulb EconoMi$er switchover (without humidity sensor).
	Flash Eight	Return air humidity sensor fault	Continue operation with single enthalpy, differential dry bulb, or dry bulb EconoMi$er switchover.
	Flash Nine	Carbon Dioxide (CO_2) sensor fault	Continue operation without ventilation control.
	Flash Ten	Onboard adjustment potentiometer fault	Continue operation with default potentiometer settings.

If the CONFIG button is pressed and held for more than 30 seconds and released, the EconoMi$er controller will enable the enthalpy comparison strategy (with outdoor air enthalpy and return air enthalpy sensors installed).

VIII. POWER FAILURE

Dampers have a spring return. In event of power failure, dampers will return to fully closed position until power is restored. *Do not manually operate damper motor.*

IX. REFRIGERANT CHARGE

Amount of refrigerant charge is listed on unit nameplate and in Table 1. Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation section for charging methods and procedures. Unit panels must be in place when unit is operating during charging procedure.

NOTE: Do not use recycled refrigerant as it may contain contaminants.

A. No Charge

Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant (refer to Table 1).

B. Low Charge Cooling

Using cooling charging chart (see Fig. 35), add or remove refrigerant until conditions of the chart are met. Note that charging chart is different from those normally used. An accurate pressure gage and temperature-sensing device is required. Charging is accomplished by ensuring the proper amount of liquid subcooling. Measure liquid line pressure at the liquid line service valve using pressure gage. Connect temperature sensing device to the liquid line near the liquid line service valve and insulate it so that outdoor ambient temperature does not affect reading.

C. To Use The Cooling Charging Chart

Use the above temperature and pressure readings, and find the intersection point on the cooling charging chart. If intersection point on chart is above line, add refrigerant. If intersection point on chart is below line, carefully recover some of the charge. Recheck suction pressure as charge is adjusted.

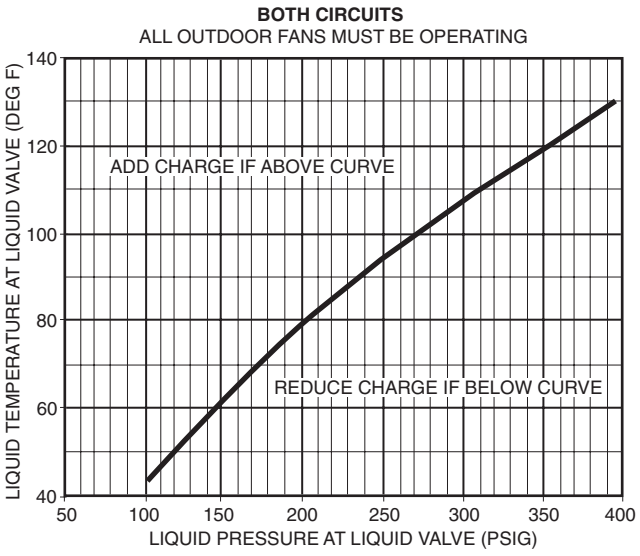


Fig. 35 — Cooling Charging Chart

NOTE: Indoor-air CFM must be within normal operating range of unit. All outdoor fans must be operating.

The TXV (thermostatic expansion valve) is set to maintain between 15 and 20 degrees of superheat at the compressors. The valves are factory set and should not require re-adjustment.

D. Perfect Humidity™ System Charging

The system charge for units with the Perfect Humidity option is greater than that of the standard unit alone. The charge for units with this option is indicated on the unit nameplate drawing. To charge systems using the Perfect Humidity Dehumidification package, fully evacuate, recover, and re-charge the system to the nameplate specified charge level. To check or adjust refrigerant charge on systems using the Perfect Humidity Dehumidification package, charge per the standard subcooling charts. The subcooler MUST be deenergized to use the charging charts. The charts reference a liquid pressure (psig) and temperature at a point between the condenser coil and the subcooler coil. A tap is provided on the unit to measure liquid pressure entering the subcooler (leaving the condenser).

X. FILTER DRIER

Replace whenever refrigerant system is exposed to atmosphere.

XI. PROTECTIVE DEVICES

A. Compressor Protection

Overtemperature

Each compressor has an internal protector to protect it against excessively high discharge gas temperatures.

Overcurrent

Each compressor has internal line break motor protection.

Crankcase Heater

All units are equipped with a 70-watt crankcase heater to prevent absorption of liquid refrigerant by oil in the crankcase when the compressor is idle. The crankcase heater is energized whenever there is a main power to the unit and the compressor is not energized.

IMPORTANT: After prolonged shutdown or servicing, energize the crankcase heaters for 24 hours before starting the compressors.

Compressor Lockout

If any of the safeties (high-pressure, low-pressure, freeze protection thermostat, compressor internal thermostat) trip, or if there is loss of power to the compressors, the CLO (compressor lockout) will lock the compressors off. To reset, manually move the thermostat setting.

B. Evaporator Fan Motor Protection

A manual reset, calibrated trip, magnetic circuit breaker protects against overcurrent. Do not bypass connections or increase the size of the breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

C. Condenser-Fan Motor Protection

Each condenser-fan motor is internally protected against overtemperature.

D. High- and Low-Pressure Switches

If either switch trips, or if the compressor overtemperature switch activates, that refrigerant circuit will be automatically locked out by the CLO. To reset, manually move the thermostat setting.

E. Freeze Protection Thermostat (FPT)

An FPT is located on the top and bottom of the evaporator coil. It detects frost build-up and turns off the compressor, allowing the coil to clear. Once the frost has melted, the compressor can be reenergized.

XII. RELIEF DEVICES

All units have relief devices to protect against damage from excessive pressures (e.g., fire). These devices protect the high and low side.

XIII. CONTROL CIRCUIT, 24-V

This control circuit is protected against overcurrent by a 3.2-amp circuit breaker. Breaker can be reset. If it trips, determine cause of trouble before resetting. See Fig. 36 and 37.

XIV. REPLACEMENT PARTS

A complete list of replacement parts may be obtained from any Bryant distributor upon request.

XV. ECONOMI$ER LEDs

The EconoMi$er control module has LEDs for diagnostic purposes. The flash code identification is shown in Table 17.

XVI. OPTIONAL HINGED ACCESS DOORS

When the optional service package is ordered or the if the hinged access doors option is ordered, the unit will be provided with external and internal hinged access doors to facilitate service.

Four external hinged access doors are provided. All external doors are provided with 2 large $^1/_4$ turn latches with folding bail-type handles. (Compressor access doors have one latch.) A single door is provided for filter and drive access. One door is provided for control box access. The control box access door is interlocked with the non-fused disconnect which must be in the OFF position to open the door. Two doors are provided for access to the compressor compartment.

Two internal access doors are provided inside the filter/drive access door. The filter access door (on the left) is secured by 2 small $^1/_4$ turn latches with folding bail-type handles. This door must be opened prior to opening the drive access door. The drive access door is shipped with 2 sheet metal screws holding the door closed. Upon initial opening of the door, these screws may be removed and discarded. The door is then held shut by the filter access door, which closes over it.

LEGEND AND NOTES FOR FIG. 36 AND 37

LEGEND

AHA — Adjustable Heat Anticipator
BRK W/AT — Breaks with Amp Turns
C — Contactor, Compressor
CAP — Capacitor
CB — Circuit Breaker
CC — Cooling Compensator
CH — Crankcase Heater
CLO — Compressor Lockout
COMP — Compressor Motor
CR — Control Relay
DAT — Discharge Air Thermistor
DM — Damper Motor
DU — Dummy Terminal
EC — Enthalpy Control
EQUIP — Equipment
FL — Fuse Link
FPT — Freeze Protection Thermostat
FU — Fuse
GND — Ground
HC — Heater Contactor
HPS — High-Pressure Switch
HTR — Heater
IFC — Indoor-Fan Contactor
IFCB — Indoor-Fan Circuit Breaker
IFM — Indoor-Fan Motor
IFR — Indoor-Fan Relay
L — Light
LPS — Low-Pressure Switch
LS — Limit Switch
NEC — National Electrical Code
OAT — Outdoor-Air Thermostat
OFC — Outdoor-Fan Contactor
OFM — Outdoor-Fan Motor
OP — Overcurrent Protection
PL — Plug Assembly
PRI — Primary
QT — Quadruple Terminal
SW — Switch
TB — Terminal Block
TC — Thermostat Cooling
TH — Thermostat Heating
TRAN — Transformer

Terminal (Marked)
Terminal (Unmarked)
Terminal Block
Splice
Factory Wiring
Field Wiring
Option/Accessory Wiring
To indicate common potential only; not to represent wiring.

NOTES:
1. Compressor and/or fan motor(s) thermally protected; 3-phase motors protected against primary single-phasing conditions.
2. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
3. Jumpers are omitted when unit is equipped with EconoMi$er.
5. IFCB must trip amps is equal to or less than 140% FLA.
6. The CLO locks out the compressor to prevent short cycling on compressor overload and safety devices. Before replacing CLO, check these devices.
7. Number(s) indicates the line location of used contacts. A bracket over (2) numbers signifies a single-pole, double-throw contact. An underlined number signifies a normally closed contact. Plain (no line) number signifies a normally open contact.

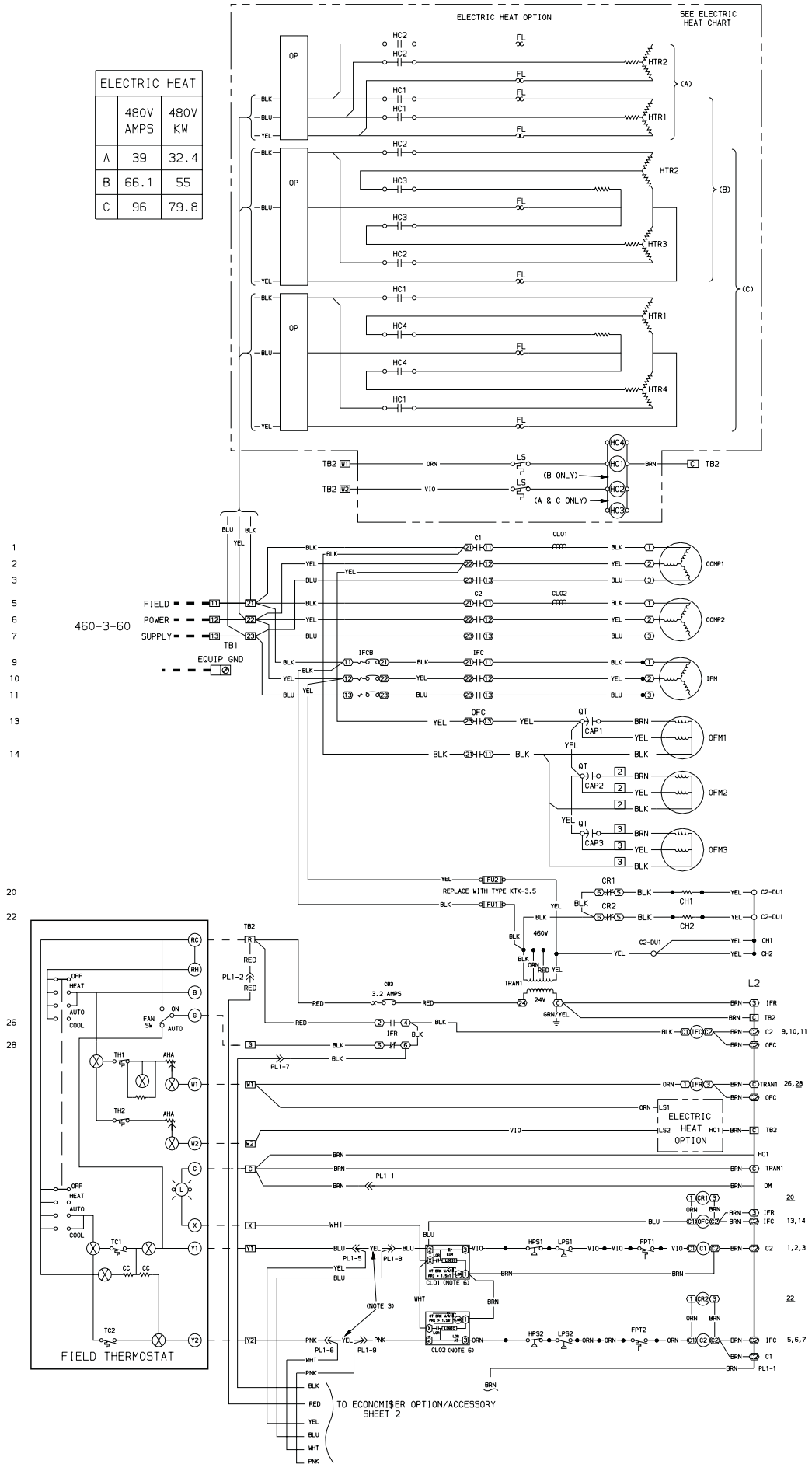


Fig. 36 — Typical Wiring Schematic (551A180, 460v Shown)

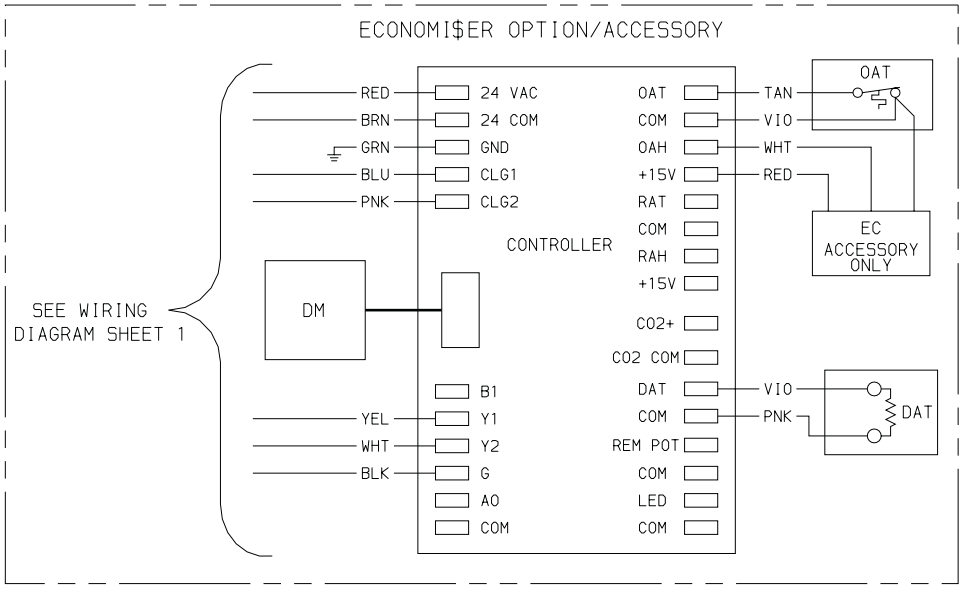


Fig. 36 — Typical Wiring Schematic (551A180, 460v Shown) (cont)

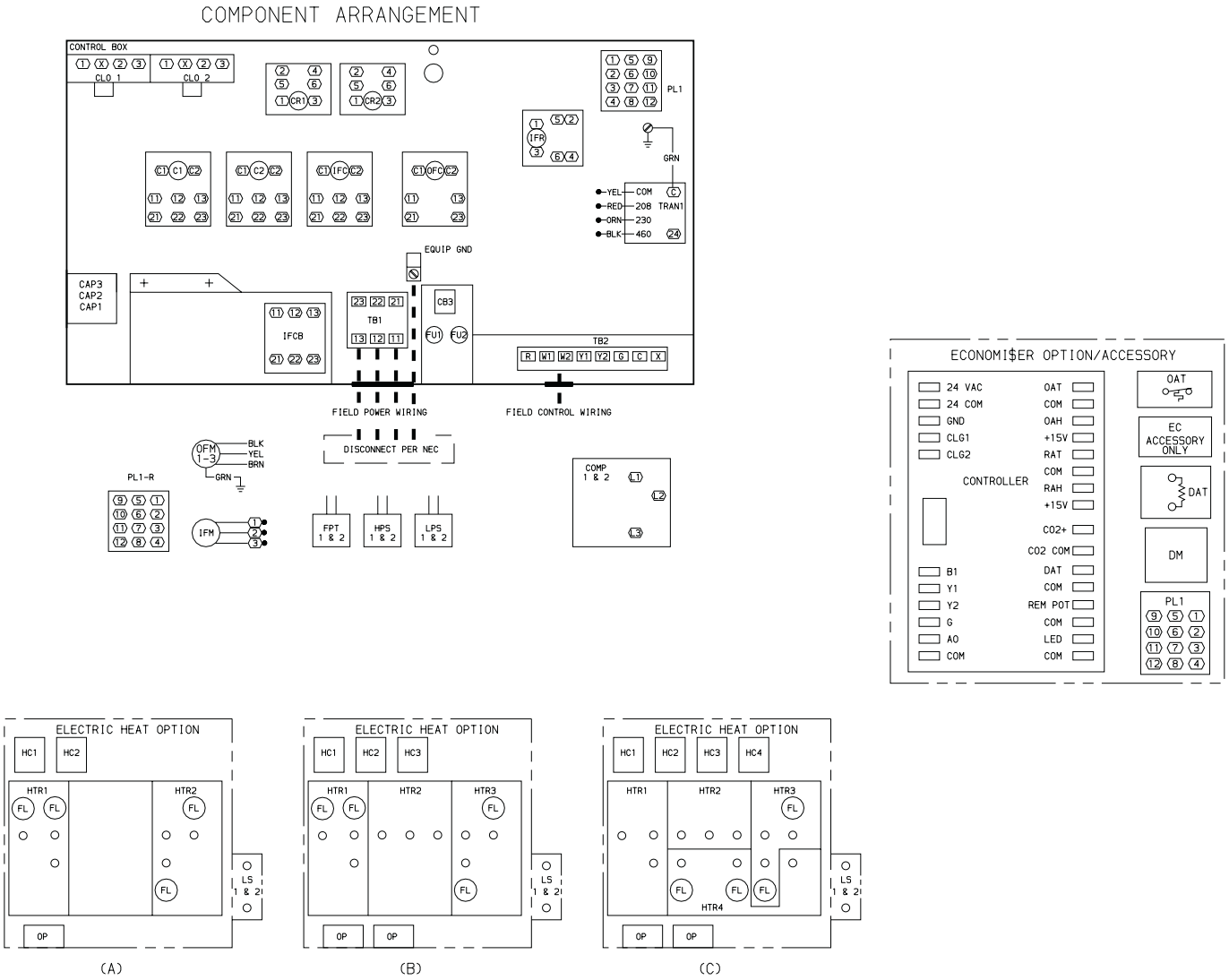


Fig. 37 — Typical Component Arrangement (551A180 Shown)

TROUBLESHOOTING

Refer to Tables 18-20 for troubleshooting details.

Table 18 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser fan will not start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, or control relay.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
Compressor will not start but condenser fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective overload.	Determine cause and replace.
	Compressor locked out	Determine cause for safety trip and reset lockout.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective overload.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor operates continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak, repair, and recharge.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
Head pressure too low.	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Restriction in liquid tube.	Remove restriction.
Excessive suction pressure.	High heat load.	Check for source and eliminate.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction pressure too low.	Dirty air filter.	Replace filter.
	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.

LEGEND

TXV — Thermostatic Expansion Valve

Table 19 — EconoMi$er Troubleshooting

PROBLEM	POTENTIAL CAUSE	REMEDY
Damper Does Not Open	Indoor (Evaporator) Fan is Off	Check to ensure that 24 vac is present at Terminal C1 (Common Power) on the IFC (Indoor [Evaporator] Fan Contactor) or that 24 vac is present at the IFO (Indoor [Evaporator] Fan On) terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram). Check proper thermostat connection to G on the connection board.
	No Power to EconoMi$er Controller	Check to ensure that 24 vac is present across Terminals 24 VAC and 24 V COM on the EconoMi$er control. If 24 vac is not present, check wiring (see unit label diagram). If 24 vac is present, STATUS light should be on constantly.
	No Power to G Terminal	If IFM is on, check to ensure 24 vac is present on G Terminal of the EconoMi$er controller. If 24 vac is not present, check wiring (see unit label diagram).
	Controller Fault	If STATUS light is flashing one flash, the EconoMi$er controller is experiencing a fault condition. Cycle power to the controller. If condition continues, replace the EconoMi$er controller.
	Thermostat Fault	If STATUS light is flashing two flashes, the EconoMi$er controller senses that the thermostat is wired incorrectly. Check wiring between the thermostat and the connection board in the electrical panel. The fault condition is caused by Y2 being energized before Y1.
	Actuator Fault	Check the wiring between the EconoMi$er controller and the actuator. Hold CONFIG button between 3 and 10 seconds to verify the actuator's operation. (This process takes 3 minutes to complete.)
EconoMi$er Operation Limited to Minimum Position	Minimum Position Set Incorrectly	Verify that the MIN POS (%) is set greater than zero. Adjust MIN POS (%) to 100% to verify operation, and then set to correct setting.
	EconoMi$er Changeover Set Point Set Too High or Too Low	Set at correct value. See Table 6.
	Discharge Air Thermistor Faulty	If STATUS light is flashing 4 flashes, Discharge Air Thermistor is faulty. Check wiring or replace sensor.
	Outdoor Air Temperature Sensor Faulty	If STATUS light is flashing 5 flashes, Outdoor Air Temperature Sensor is faulty. Check wiring or replace sensor.
Damper Position Less than Minimum Position Set Point	Supply Air Low Limit Strategy Controlling	The supply-air temperature is less than 45 F, causing the minimum position to be decreased. Refer to the Start-Up instructions. Verify correct setting of MIN POS (%). If correct, EconoMi$er is operating correctly.
Damper Does Not Return to Minimum Position	CO_2 Ventilation Strategy Controlling	If a CO_2 sensor is being used, and the damper position is greater than minimum position, the ventilation control strategy is controlling. Refer to the Start-Up instructions. EconoMi$er is operating correctly.
Damper Does Not Close on Power Loss	Damper Travel is Restricted	Check to ensure the damper is not blocked.

LEGEND

IFM — Indoor Fan Motor
PL — Plug

Table 20 — Perfect Humidity™ Dehumidification Subcooler Service Analysis

PROBLEM	CAUSE	REMEDY
Subcooler will not energize	No power to subcooler control transformer.	Check power source. Ensure all wire connections are tight.
	No power from subcooler control transformer to liquid line three way valve.	1. Fuse open; check fuse. Ensure continuity of wiring. 2. Subcooler control low-pressure switch open. Cycle unit off and allow low-pressure switch to reset. Replace switch if it will not close. 3. Transformer bad; check transformer.
	Liquid line three-way valve will not operate.	1. Solenoid coil defective; replace. 2. Solenoid valve stuck closed; replace.
Subcooler will not deenergize	Liquid Line three-way valve will not close.	Valve is stuck open; replace.
Low system capacity	Low refrigerant charge or frosted coil.	1. Check charge amount. See system charging section. 2. Evaporator coil frosted; check and replace subcooler control low pressure switch if necessary.

Copyright 2001 Bryant Heating & Cooling Systems

START-UP CHECKLIST

MODEL NO.: _____ SERIAL NO.: _____

DATE: _____ TECHNICIAN: _____

I. PRE-START-UP:

- ☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY INSTALLATION OF INDOOR FAN MOTOR ADJUSTMENT BOLT (155 UNITS) OR ADJUSTMENT BOLT AND PLATE (180, 240 UNITS)
- ☐ VERIFY INSTALLATION OF OUTDOOR AIR HOOD
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS
- ☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT
- ☐ CHECK THAT FILTERS AND SCREENS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SETSCREW IS TIGHT
- ☐ VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED
- ☐ VERIFY THAT SCROLL COMPRESSORS ARE ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY THAT CRANKCASE HEATER HAS BEEN ENERGIZED FOR 24 HOURS

II. START-UP:

ELECTRICAL

SUPPLY VOLTAGE L1-L2 _____ L2-L3 _____ L3-L1 _____

COMPRESSOR AMPS — COMPRESSOR NO. 1 L1 _____ L2 _____ L3 _____

— COMPRESSOR NO. 2 L1 _____ L2 _____ L3 _____

SUPPLY FAN AMPS _____ EXHAUST FAN AMPS _____

ELECTRIC HEAT AMPS (IF SO EQUIPPED) L1 _____ L2 _____ L31 _____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE _____ F DB (Dry-Bulb)

RETURN-AIR TEMPERATURE _____ F DB _____ F WB (Wet-Bulb)

COOLING SUPPLY AIR _____ F

ELECTRIC HEAT SUPPLY AIR (IF SO EQUIPPED)_____ F

PRESSURES

REFRIGERANT SUCTION CIRCUIT NO. 1 _____ PSIG CIRCUIT NO. 2 _____ PSIG

REFRIGERANT DISCHARGE CIRCUIT NO. 1 _____ PSIG CIRCUIT NO. 2 _____ PSIG

- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHART ON PAGE 29.

GENERAL

- ☐ ECONOMI$ER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS
- ☐ VERIFY INSTALLATION OF ALL OPTIONS AND ACCESSORIES

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Copyright 2001 Bryant Heating & Cooling Systems